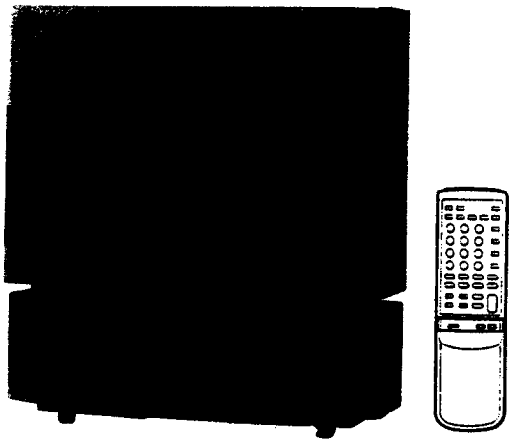
KPR-S46MN1/S53MN1
RM-821

SERVICE MANUAL

ME Model
KPR-S46MN1
Chassis No. SCC-F66A-A
KPR-S53MN1
Chassis No. SCC-F66B-A



KiRARA BASSO

AP-1GA CHASSIS

SPECIFICATIONS

Structure	Screen and projector, rear projection type
Projection system	3 picture tubes, 3 lenses, horizontal in-line system
Picture tube	7-inch, High-brightness monochrome tubes (5.5 raster size), with optical coupling and liquid cooling system
Projection lenses	High performance, large-diameter hybrid lens F 1.0
Screen material	Plastic lenticular, Plastic fresnel
Television standard	B/G, SECAM, NTSC$_{4.43}$, NTSC$_{3.58}$
NICAM stereo system	B/G system
Antenna	75-ohm external antenna terminal
Speakers	Woofer 13 cm Tweeter 2.5 cm

Model	KPR-S46MN1	KPR-S53MN1
Resolution	859 lines	900 lines
Projected picture size (measured diagonally)	46 inches	53 inches
Screen brightness	1,644 cd/m^2	1,233 cd/m^2
Dimensions (w/h/d)	1103.9 x 1289.1 x 506.8 mm	1237.9 x 1301.9 x 609.6 mm
Mass	73 kg	85 kg

Power requirements	220—240 V AC, 50/60 Hz
Power consumption	325 W
Accessories supplied	RM-821 Remote Commander (1) R6 batteries (2)
Optional accessories	RM-829 Remote Commander

Inputs

Jack	S VIDEO	VIDEO	AUDIO L/R
VIDEO 1	4-pin mini DIN Y: 1 Vp-p, 75 ohms, unbalanced, sync negative C: 0.286 Vp-p, 75 ohms	Phono jack 1 Vp-p, 75 ohms, unbalanced, sync negative	0.5 Vrms (standard level, 47 kiloohms)
VIDEO 2			
VIDEO 3	—		
VIDEO 4	4-pin mini DIN Y: 1 Vp-p, 75 ohms, unbalanced, sync negative C: 0.286 Vp-p, 75 ohms		

MODELS OF THE SAME SERIES	
KPR-S46MN1/S53MN1	

Output

Jack	S VIDEO	VIDEO	AUDIO L/R
VIDEO 1	4-pin mini DIN Y: 1 Vp-p, 75 ohms, unbalanced, sync negative C: 0.286 Vp-p, 75 ohms	1 Vp-p, 75 ohms, unbalanced, sync negative	0.5 Vrms (standard level, 5 kiloohms or less)
VIDEO 2			
VIDEO 4			
MONITOR			
AUDIO OUT	—	—	

Design and specifications are subject to change without notice.

MICROFILM

PROJECTION TV

SONY®

Channel Coverage

MIDDLE EAST/ASIA (B/G, H)

Receivable Channel	Channel Display
E-2 to E-12 E-21 to E-69	C02 to C12 C21 to C69
Indonesia	
2 to 11	C03 to C12
Morocco	
M-4 to M-7 M-8 to M-10	C70 to C73 C8 to C10
New Zealand	
2 3 4 to 9	C03 C04 C05 to C10

CATV W. EUROPE (B/G, H)

Receivable Channel	Channel Display
S-01 to S-03 S-1 to S-41	C42 to C44 C01 to C41

AUSTRALIA (B/G, H)

Receivable Channel	Channel Display
Australia	
AS-0 to AS-11 AS-5A AS-28 to AS-69	C00 to C11 C12 C28 to C69
New Zealand	
2 to 3 4 to 7 8 9	C01 to C02 C06 to C09 C13 C10

HK/UK (I)

Receivable Channel	Channel Display
Hong Kong, United Kingdom	
B-21 to B-68	C21 to C68
Ireland	
B,C,..., J	C02, C03,..., C09
South Africa	
4 to 13 21 to 68	C04 to C13 C21 to C68

E.EUROPE/CHINA (D/K)

Receivable Channel	Channel Display
East European countries	
R-1 to R-12 R-21 to R-60	C01 to C12 C21 to C60
China	
C-1 C-2 C-3 C-4 C-5 C-6 C-7 to C-12 C-13 to C-24 C-25 to C-47 C-48 to C-57	C01 C02 C13 C03 C04 C14 C06 to C11 C21 to C32 C38 to C60 C61 to C70

AMERICA (M)

Receivable Channel	Channel Display
2 to 83	C02 to C83

CATV AMERICA (M)

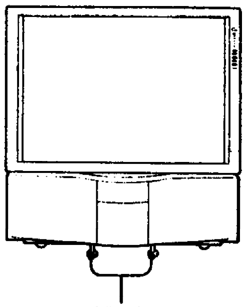
Receivable Channel	Channel Display
2 to 13 A-1 A-2 A-3 A-4 A-5 A-6 A-7 A-8 A, B,..., W AA,..., CCC	C02 to C13 C99 C98 C97 C96 C95 C06 C05 C01 C14, C15,..., C36 C37,..., C65

JAPAN

Receivable Channel	Channel Display
J-1 to J-62 C-13 to C-32	C01 to C62 C80 to C99

Stabilizing the Projection TV

The TV should be installed so that it is as level as possible, for safety purposes. After setting up, always lower the two adjustable legs located at the bottom, by turning the legs to the left, to stabilize the TV.



CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONENTS

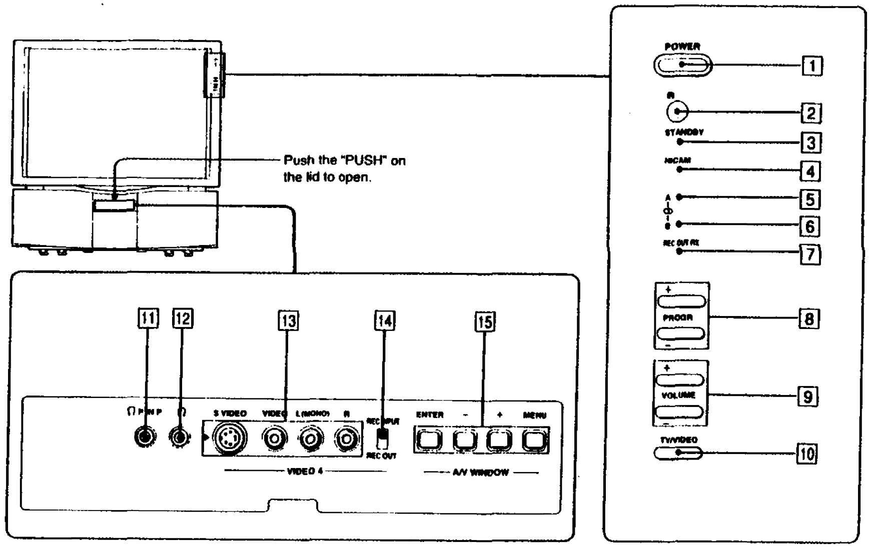
SECTION 1
GENERAL

The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remein as in the manual.

Overview

This section briefly describes the buttons and controls on the TV set and on the Remote Commander. For more information, refer to the pages given next to each description.

TV



1 POWER switch ● ●

2 ■ Remote control detector
Operate the Remote Commander pointed at here.

3 STANDBY lamp

4 NICAM lamp ●

5 A mode lamp ●

6 B mode lamp ●

7 REC OUT(recording output) FIX lamp ●

8 PROGR (program) +/– buttons ●
Press to select a program.

9 VOLUME +/– buttons ●
Press to adjust the volume.

10 TV/VIDEO button ●

11 ∩ P IN P (Picture In Picture) headphones jack
Connect headphones to listen to the sound of P IN P picture.

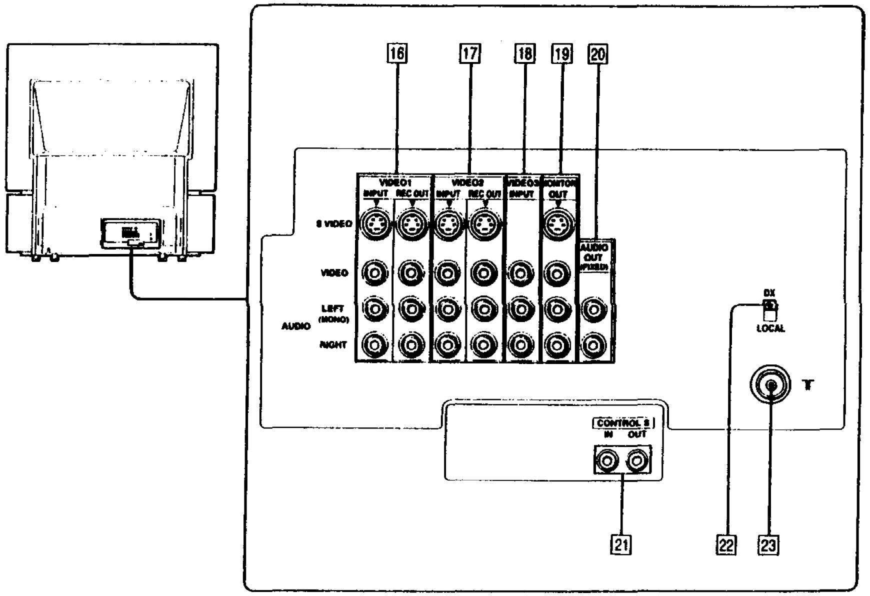
12 ∩ Headphones jack
Connect headphones to listen personally.

13 VIDEO 4 connectors ●

14 VIDEO 4 REC INPUT/REC OUT(recording input/output) button ●
Press to switch the video 4 connectors to input or output.

15 Menu and A/V(audio/video) WINDOW function buttons ●●●●●●●●●●

Rear



16 VIDEO 1 INPUT/REC OUT(recording output) jacks ●

17 VIDEO 2 INPUT/REC OUT(recording output) jacks ●

18 VIDEO 3 INPUT jacks ●

19 MONITOR OUT(output) jacks
Connect another TV or monitor.

20 AUDIO OUT(output) (FIXED) jacks ●

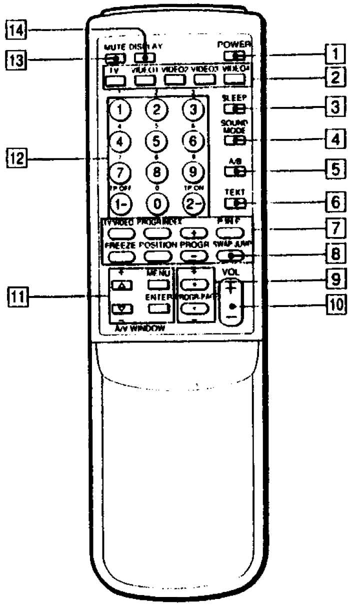
21 CONTROL S INPUT/OUTPUT jacks
To control the TV with the Remote Commander to be pointed at another Sony equipment, connect the Sony equipment to INPUT.
To control another Sony equipment with the Remote Commander to be pointed at the TV, connect the Sony equipment to OUTPUT.

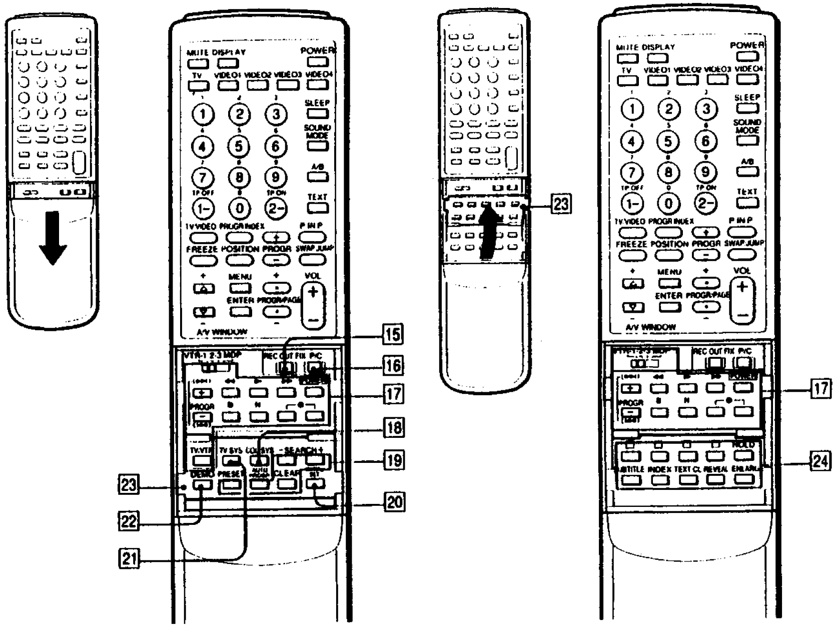
22 DX/LOCAL switch
Normally set this switch to DX. If the sound is noisy, or lines or stripes appear on the screen because of too strong TV signal, set the switch to LOCAL.

23 ╥ (antenna) terminal ●

Overview

Remote Commander





1 POWER button ●

2 TV, VIDEO 1, VIDEO 2, VIDEO 3, VIDEO 4 (FRONT) input select buttons ●

3 SLEEP button ●
Press to set the sleep timer so that the TV automatically switches into standby mode.

4 SOUND MODE button ●
Press to select the sound mode according to the program.

5 A/B button ●
Press to select the sound mode of stereo or bilingual program.

6 TEXT button ●
Press to switch to teletext mode.

7 P IN P (Picture In Picture) screen control buttons ● ●

8 JUMP button ●

9 PROGR(program)/PAGE +/– buttons ● ● ●

10 VOL(volume) +/– buttons ●

11 Menu and A/V(audio/video) WINDOW function buttons ● ● ● ● ● ● ● ● ● ●

12 Program number buttons ●

13 MUTE button ●

14 DISPLAY button ●
Press to display current mode and program position.

15 REC OUT(recording output) FIX button ●
Press to fix the source to be recorded.

16 P/C (program position/channel) button ●

17 VTR/Multi disc player controls

When the panel 23 is in the lower position

18 COL SYS(color system) button ●
Press to select a color system.

19 Channel presetting buttons ● ●

20 INITIAL SET button
Press to reset the adjustment and setting to factory-set mode.

21 TV SYS(system) button ● ●
Press to select a TV system.

22 DEMO(demonstration) button ●
Press to see all the menu pages in sequence.

23 Panel
Make sure that the panel is fixed in the upper or lower position.

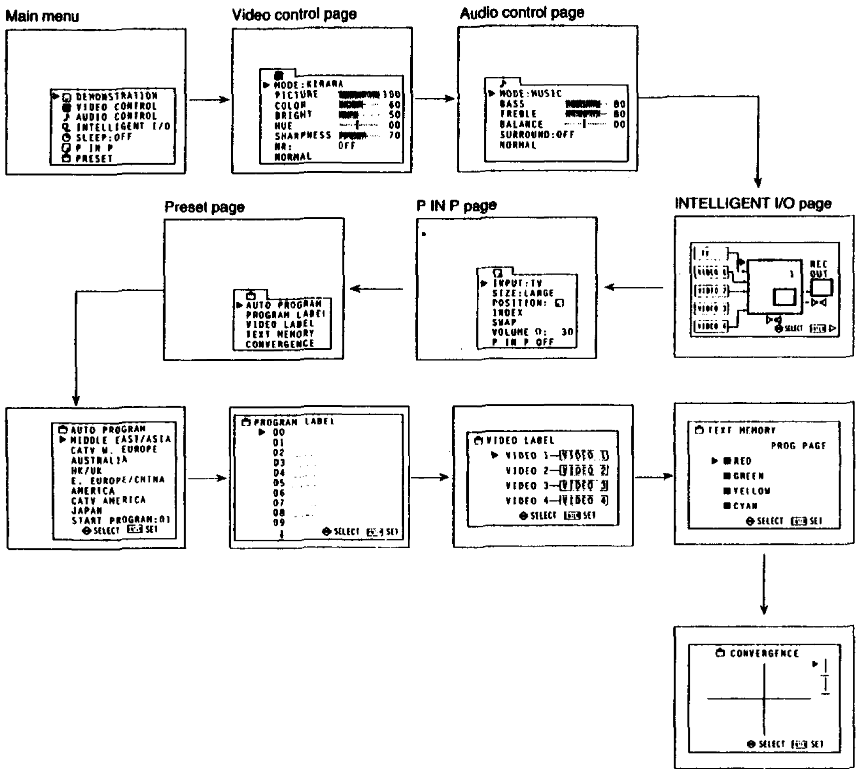
When the panel is in the upper position

24 Teletext operation buttons ● ●

Introduction of Menu

You will perform presetting, adjustment and other setting on the menu. Before beginning the presetting and operation, we suggest to have a look at the pages in the menu.

Press the DEMO button on the Remote Commander.
All the menu pages appear in sequence, and repeatedly.
To stop demonstration, press any button.



Presetting the Channels

Channel Allocation

Areas allocated in "MIDDLE EAST/ASIA" channel system
Afghanistan, Albania, Algeria, Austria, Bahrain, Bangladesh, Belgium, Brunei, Canary Islands, Cyprus, Denmark, Egypt, Finland, Germany, Ghana, Gibraltar, Greece, Iceland, India, Indonesia, Iran, Iraq, Italy, Jordan, Kenya, Republic of Korea, Kuwait, Lebanon, Liberia, Libya, Luxemburg, Malaysia, Malta, Mauritania, Mauritius, Maldives Rep., Morocco, Mozambique, Nepal, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Portugal, Qatar, Sarawak, Saudi Arabia, Seychelles, Sierra Leone, Singapore, Spain, Srilanka, Sudan, Swaziland, Sweden, Switzerland, Syrian Arab Rep., Tanzania, Thailand, Tunisia, Turkey, Uganda

Areas allocated in "CATV W. EUROPE" channel system
United Arab Emirates, Western Sahara, Yemen Arab Republic, People's Dem. Rep. of Yemen, Yugoslavia, Zambia, Zimbabwe

Areas allocated in "AUSTRALIA" channel system
Australia, New Zealand

Areas allocated in "HK/UK" channel system
Hong Kong, Ireland, Lesotho, South Africa, United Kingdom

Areas allocated in "E. EUROPE/CHINA" channel system
Benin, Bulgaria, China, Congo, Czechoslovakia, Djibouti Republic, Gabon, Guadeloupe, Guiana, Guinea (P.P.R.), Hungary, Ivory Coast, Dem. People's Rep. of Korea, Madagascar, Mongolia, New Caledonia, Niger, Poland, Reunion, Rumania, Senegal, Tahiti, Togo, Former U.S.S.R., Vietnam, Zaire

Areas allocated in "AMERICA" channel system
Bahama Islands, Barbados, Belize, Bermuda, Bolivia, Burma(UHF), Canada, Chile, Colombia, Costa Rica, Cuba, Dominica Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Hawaii, Honduras, Jamaica, Laos, Mexico, Panama, Peru, Philippines, Puerto Rico, Surinam, Taiwan, Trinidad & Tobago, U.S.A., Venezuela

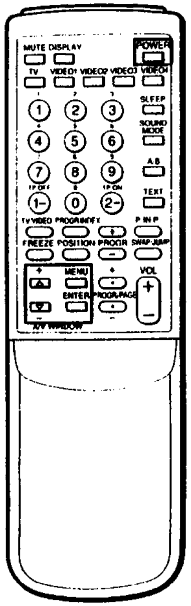
Areas allocated in "CATV AMERICA" channel system
U.S.A.(CATV)

Areas allocated in "JAPAN" channel system
Japan (UHF, VHF), Burma (Myanmar) (VHF)

TV and Color System of the Channel System

The TV system and color system are automatically set according to the channel system.

Channel system	TV system	Color system
MIDDLE EAST/ASIA	B/G, H; West European TV standard	AUTO
CATV W.EUROPE	B/G, H; West European TV standard	AUTO
AUSTRALIA	B/G, H; Australian TV standard	AUTO
HK/UK	I; British TV standard	AUTO
E.EUROPE/CHINA	D/K; East European TV standard	AUTO
AMERICA	M; American TV standard	AUTO
CATV AMERICA	M; American TV standard	AUTO
JAPAN	M; Japan TV standard	AUTO



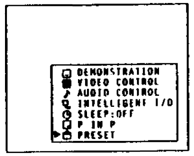
Preset Channels Automatically

Up to 30 receivable channels from the lowest channel are automatically preset in the consecutive program positions (1 to 29, 0).
With this method, you can preset all receivable channels at once.

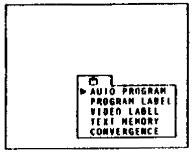
1 Press the POWER switch of the TV to turn on the TV.

2 Press MENU on the Remote Commander.

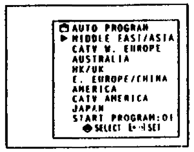
3 Move the red cursor to "PRESET" using Δ or ∇, then press ENTER.



4 Move the red cursor to "AUTO PROGRAM" using Δ or ∇, then press ENTER.



5 Move the red cursor to your channel system using Δ or ∇, according to the list on page 13, then press ENTER.
Presetting starts from program position 1. When presetting is finished, 1 (program number) appears.

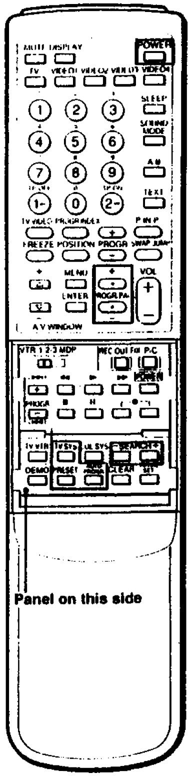


Program and channel numbers

P01 C01 → P01 C02 → P02 C03 ---→ 1

If you want to start a program number other than 1
Before pressing ENTER in step 5, press PROGR +/– or the number button until the number you want appears at "START PROGRAM : _".

If you cannot use the Remote Commander
Use the MENU, ENTER, + and – buttons on the TV, and perform as above.



Panel on this side

To preset the channels automatically without using the menu

1 Press the POWER switch of the TV to turn on the TV.

2 Press PRESET on the Remote Commander.

P01 C01

3 Select your channel system by pressing TV SYS, referring to "Channel Allocation" on page 13.

MIDDLE EAST/ASIA → CATV W. EUROPE → AUSTRALIA → HK/UK
↑ ↓
JAPAN ← CATV AMERICA ← AMERICA ← E.EUROPE/CHINA

4 Press AUTO PROGR.

P01 C01 → P01 C02 → P02 C03 ---→ 1

Preset Channels Manually

Use this method if there are only a few channels in your area to preset or if you want to preset channels one by one.

1 Press the POWER switch of the TV to turn on the TV.

2 Press PRESET on the Remote Commander.

P01 C01

3 Using the PROGR/PAGE + and – buttons, select the program position to which you want to preset a channel.

P03 C01

4 Select your channel system by pressing TV SYS.

MIDDLE EAST/ASIA → CATV W. EUROPE → AUSTRALIA → HK/UK
↑ ↓
JAPAN ← CATV AMERICA ← AMERICA ← E.EUROPE/CHINA

5 Tune in the channel, using the SEARCH +/– buttons.
The channel number starts counting up or downwards.
When a channel is found, it stops.

P03 C01

6 Repeat steps 3 to 5 to preset other channels.

7 Press PRESET.

3

Additional Presetting Functions

Skipping Program Positions

You can skip unused program positions when selecting programs with the PROGR/PAGE + and – buttons. However, the skipped programs may still be called up when you use the number buttons.

1 Press PRESET.

P01 C01

2 Select the program position using PROGR/PAGE + and – buttons.

P03 C01

3 Press CLEAR.

P03 C--

4 Press PRESET.

1

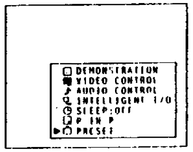
Repeat steps 1 to 4 to skip other program positions.

Captioning a Station Name

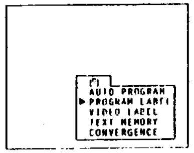
You can "name" a channel using up to four characters so that the name is displayed under the program number. Using this function, you can easily identify which channel you are watching.

1 Press MENU.

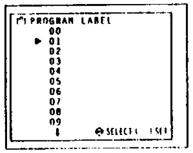
2 Move the red cursor to "PRESET" using Δ or ∇, then press ENTER.



3 Move the red cursor to "PROGRAM LABEL" using Δ or ∇, then press ENTER.



4 Move the red cursor to the program number you want using Δ or ∇, then press ENTER. The first underline of the selected program number turns red.



5 Select a character using Δ or ∇, then press ENTER. The next underline turns red. Write character for each underline in the same way.
If you do not want to write a character, press ENTER.

[01 C] → [01 CB] → [01 CBS]

Usable characters: A to Z, 0 to 9, –, :, /, .(period), + and space

6 Repeat steps 4 and 5 to caption other program numbers.

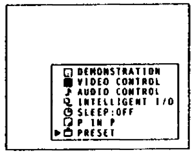
7 When you finished, press MENU.

Captioning a Video Input

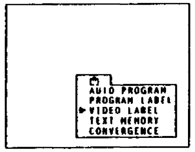
Using this function, you can identify the source (VHS, Beta, 8mm, Multi disc player, Tuner) of the video inputs, as the source is displayed under the video input.

1 Press MENU.

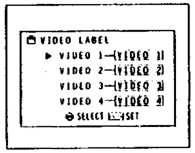
2 Move the red cursor to "PRESET" using Δ or ∇, then press ENTER.



3 Move the red cursor to "VIDEO LABEL" using Δ or ∇, then press ENTER.



4 Move the red cursor to the video input (1, 2, 3, 4) you want using Δ or ∇.



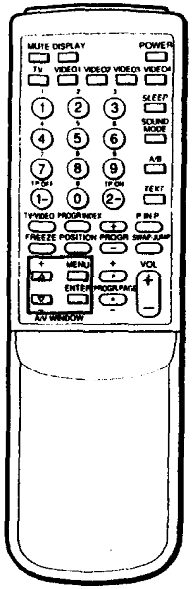
5 Press ENTER until the source name appears.

[VIDEO 1] → [VHS] → [BETA] → [8mm] → [LD] → [TUNER]

6 Repeat steps 4 and 5 for other video input.

7 When you finished, press MENU.

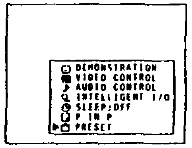
Adjusting Color Registration (CONVERGENCE)



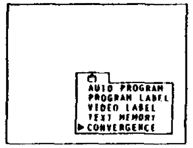
In a TV, the projection tube image appears on the screen in three color layers (red, green and blue). If these layers are not in proper registration, the color is poor and the picture blurs. To correct this, perform the CONVERGENCE adjustment.

1 Press MENU.

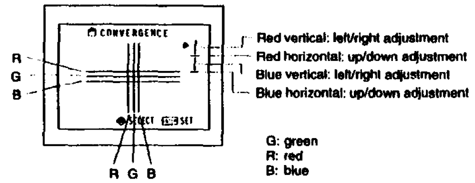
2 Move the red cursor to "PRESET" using Δ or ∇, then press ENTER.



3 Move the red cursor to "CONVERGENCE" *using Δ or ∇, then press* ENTER.

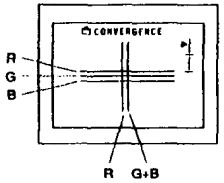


4 Move the red cursor to the symbol representing the line you want *using Δ or ∇, then* press ENTER.

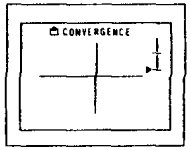

CONVERGENCE
R
G
B
SELECT
SET
R G B
Red vertical: left/right adjustment
Red horizontal: up/down adjustment
Blue vertical: left/right adjustment
Blue horizontal: up/down adjustment

G: green
R: red
B: blue

5 Press Δ or ∇ until the line converges with the center green line, then press ENTER.
To move the line up or to the right, use Δ.
To move the line down or to the left, use ∇.

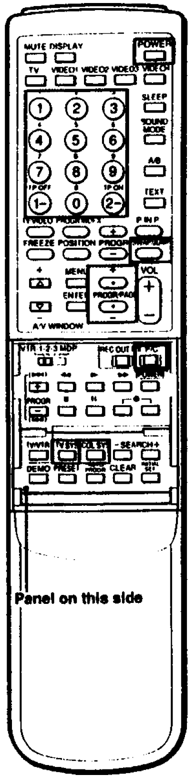


6 Repeat steps 4 and 5 to adjust the other lines, until all the lines have overlapped to form a white cross.



7 When you finished, press MENU.

Watching the TV



This section explains the basic functions you use while watching the TV.

Switching the TV on and off

Switching on
Press the POWER switch of the TV.

Switching off temporarily
Press POWER on the Remote Commander.
The TV enters standby mode and the standby indicator on the front of the TV lights up.

Switching on again
Press POWER, TV, PROGR/PAGE +/–, or one of the number buttons on the Remote Commander.
If you cannot use the Remote Commander, press PROGR +/– on the TV.

Switching off completely
Press the POWER switch of the TV.

Selecting TV Programs

Press PROGR/PAGE +/– or press number buttons.
To select program 5, press "5".
To select program 10, press "1–" "0".
To select program 25, press "2–" "5".

To return to the previous program number
Press JUMP. (This button functions as SWAP when the P IN P (see page 25) is displayed.)

If the sound is noisy or not heard
Press TV SYS until the sound becomes clear.

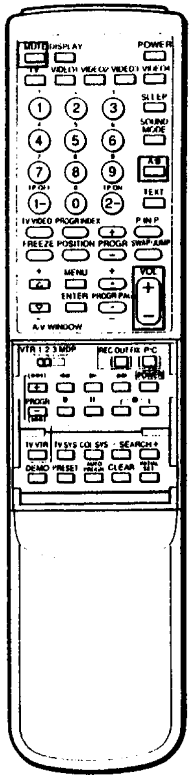
If the color program does not appear in color
Press COL SYS until the color becomes normal.

Selecting TV Program by Channel Number (not by program number)

See page 33 for the channel numbers.
1 Press P/C so that C-- appears.
2 While C-- is on, select the channel system by pressing TV SYS.
The TV becomes channel tuning mode.
3 While C-- is on, press the channel number.
To select channel 5, press "0", "5".
To select channel 25, press "2", "5".

To skip channels
1 Press P/C so that C-- appears.
2 Select the channel number to be skipped using the number buttons or PROGR/PAGE +/– buttons.
3 Press CLEAR.
Repeat steps 1 to 3 to skip other channels.
To restore the skipped channel, tune in the channel and press PRESET.

To select TV programs by program number
1 Press P/C so that P-- appears.
2 While P-- is on, press the program number.



Adjusting the Volume

Press VOL +/–.

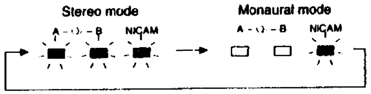
Muting the Sound

Press MUTE.

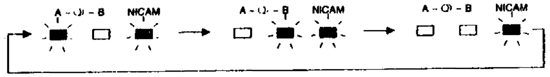
To resume normal sound, press MUTE again.

Receiving a Stereo or Bilingual Program

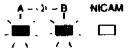
When the TV receives a NICAM stereo system program
The NICAM lamp, A and B mode lamps light. Press A/B to select stereo or monaural mode.
If the signal is very weak, the sound becomes monaural. The NICAM, A and B mode lamps go off.



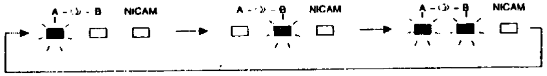
When the TV receives a NICAM bilingual system program
The NICAM lamp, A and/or B mode lamp(s) light. Press A/B so that the lamp (A or B) of the mode you want lights up.



When the TV receives a German stereo system program
The A and B mode lamps light.
If the signal is very weak, the sound becomes monaural. The lamps go off.

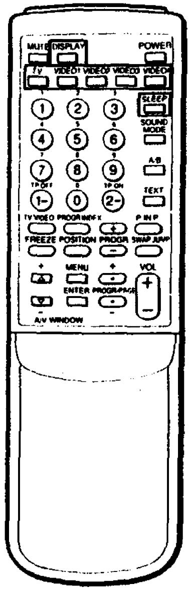


When the TV receives a German bilingual system program
A and/or B mode lamp(s) light(s). Press A/B so that the lamp (A, B, or A and B) of the mode you want lights up.



Who can receive the NICAM stereo/bilingual system
The NICAM stereo/bilingual system is receivable in Hong Kong, Singapore, New Zealand, etc.

Who can receive the German stereo/bilingual system
The German stereo/bilingual system is receivable in Australia, Malaysia, Thailand, etc.



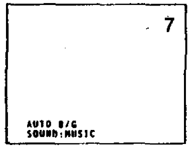
Watching Video Input

Using the VIDEO 1, VIDEO 2, VIDEO 3, and VIDEO 4 buttons, select the video input.
To go back to the normal TV picture, press TV.

When you select VIDEO 4
If "SELECT INPUT MODE" appears on the screen, press the VIDEO 4 REC INPUT/REC OUT button on the front panel of the TV to select REC INPUT (⏏).

On the TV
Press TV/VIDEO.

Displaying the On-screen Indications



Press DISPLAY.
The program number, color and TV system setting and sound mode appear. They, except the program number, will disappear after some seconds.
Press again to make indications disappear.

In channel tuning mode (C--), channel number, channel system and sound mode appear.

Using the Sleep Timer

You can select the time period after which the TV automatically switches into standby mode.
Select the time period by pressing SLEEP.
The time period (in approximate minutes) changes as follows:

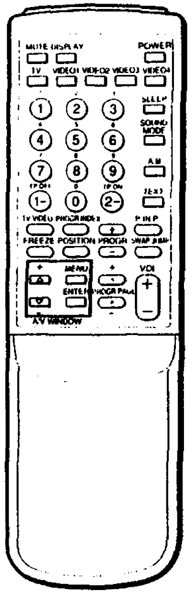
SLEEP OFF → SLEEP 30 → SLEEP 60 → SLEEP 90

About one minute before the TV switches into standby mode, "SLEEP" is displayed on the screen.

To switch off the sleep timer
Press SLEEP until "SLEEP OFF" appears.

To check the remaining time
Press SLEEP.
If you do not want to change the remaining time, leave it until it disappears automatically.

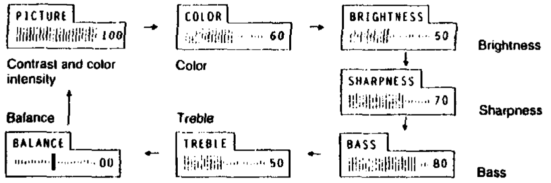
Setting the sleep timer using the menu or on the TV set
Use the MENU, ENTER, Δ and ∇ buttons on the Remote Commander or on the TV.
1 Press MENU.
2 Move the cursor to "SLEEP" using Δ or ∇.
3 Press ENTER until the time period you want appears at "SLEEP: __".



Adjusting the Picture and Sound

Although the picture and sound are adjusted at the factory, you can adjust them to suit your own taste.

1 Select the item by pressing ENTER.



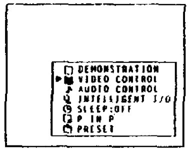
2 Using Δ or ∇ button, adjust the item to your taste.

Adjusting the picture and sound using the menu or on the TV set
Use the MENU, ENTER, Δ and ∇ buttons on the Remote Commander or on the TV.

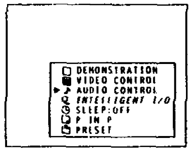
1 Press MENU.

2 To adjust the picture, move the red cursor to "VIDEO CONTROL" using Δ or ∇, then press ENTER.
To adjust the sound, move the red cursor to "AUDIO CONTROL" using Δ or ∇, then press ENTER.

Video control

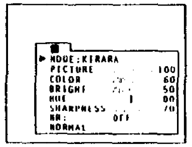


Audio control

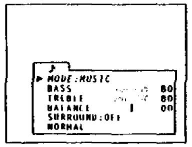


3 *Move the red cursor to the item you want to adjust using Δ or ∇, then press ENTER.*

Video control

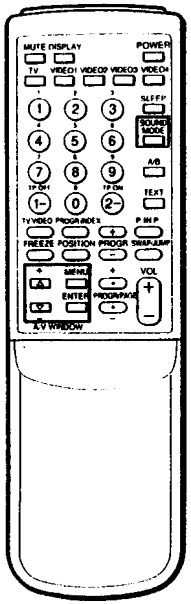


Audio control



4 Adjust the item. (See the table on page 24.)

5 Press MENU to turn off the menu.



Effect of each control

Picture

Item	Press	Effect
MODE	ENTER	→ KIRARA → MIDDLE → SOFT
PICTURE	Δ/∇ → ENTER	Less ········ More
COLOR	Δ/∇ → ENTER	Less ········ More
BRIGHT	Δ/∇ → ENTER	Darker ········ Brighter
HUE	Δ/∇ → ENTER	Greenish ···· ❙ ···· Reddish (for NTSC signal only)
NR[1]:	ENTER	→ OFF → ON
NORMAL	ENTER	"NORMAL" becomes red in a moment and the settings are reset to the factory preset levels.

1) Noise reduction. Set to ON when the picture is noisy because of a weak signal or tape deterioration.

Sound

Item	Press	Effect
MODE	ENTER	→ MUSIC → STANDARD → NEWS
BASS	Δ/∇ → ENTER	Less ········ More
TREBLE	Δ/∇ → ENTER	Less ········ More
BALANCE	Δ/∇ → ENTER	Left speaker ···· ❙ ···· Right speaker
SURROUND	ENTER	→ OFF → MUSIC[2] → MOVIE[3] → SPACE[4]
NORMAL	ENTER	"NORMAL" becomes red in a moment and the settings are reset to the factory preset levels.

2) MUSIC mode is effective for music programs.
3) MOVIE mode is effective for movie programs.
4) SPACE mode gives spacious monaural sound.

Note

When the menu is displayed, you cannot change the program using the number buttons. Use PROGR/PAGE +/–.

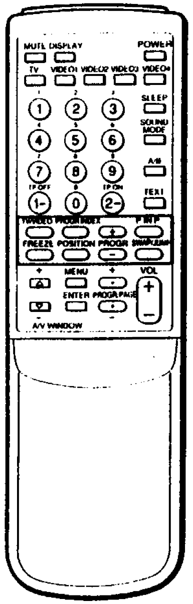
Selecting the Sound Mode

You can select a proper sound mode in accordance with the program.
Select the sound mode by pressing SOUND MODE.

MUSIC	Music program: The high and low tones are emphasized.
STANDARD	Standard sound
NEWS	News program: The person's voice becomes easy to hear.

Picture In Picture (P IN P)

Buttons for P IN P operation



With this function you can display a "P IN P screen" (small picture) within the main picture of TV program or video input. In this way you can watch or monitor TV program or the video input from any connected equipment while watching TV or other video input. For information about connection of other equipment, see page 29.

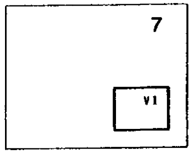
Switching P IN P on and off
Press P IN P.
The P IN P screen is displayed. The P IN P picture comes from the source chosen when the TV was last used.

To switch P IN P off
Press P IN P again.

Selecting a P IN P source
To select a TV program, use PROGR + and – buttons of the P IN P section.
To select a video input, press TV/VIDEO.

Each time you press TV/VIDEO, the indication at the top right corner of the P IN P screen changes:

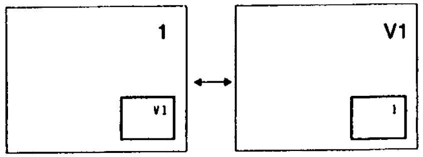
→TV program number → V1 → V2 → V3 → V4



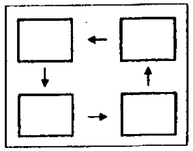
Notes

- If no video source has been connected, the P IN P screen is black.
- You may not be able to receive some channels in P IN P, even though they are being received for the main picture.
- If you display the signals for different color systems (PAL, SECAM, NTSC) for the main picture and in the P IN P, size of the P IN P may be different.
- If a TV channel in which no program is broadcast is received for the P IN P screen, the program number of P IN P may become black.

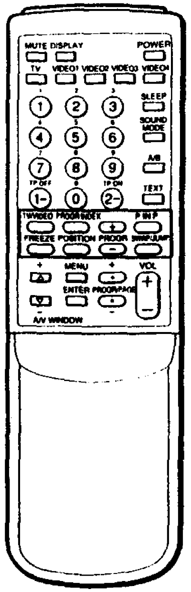
Swapping screens
Press SWAP.
The main screen switches the picture with the P IN P screen.



Changing the position of the P IN P
Press POSITION repeatedly to change the position of the P IN P screen. There are four different positions available.



Picture In Picture (P IN P)



Freezing the P IN P picture

Press FREEZE.
To restore the normal picture, press FREEZE again.

Note

If you press FREEZE when there is no P IN P screen, the main picture is frozen and appears in the P IN P screen.

Checking the programs available

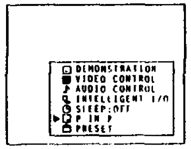
Press PROGR INDEX. The preset programs appear in the P IN P screen one by one in sequence.
To stop checking programs, press PROGR INDEX.

Operating P IN P using the menu or on the TV

Use the MENU, ENTER, Δ and ∇ buttons on the Remote Commander or on the TV.

Using the menu, you can change the P IN P size and adjust the P IN P headphones volume to hear through the headphones besides the above operations (except freezing).

1 Press MENU.
2 *Move the red cursor to "P IN P" using Δ or ∇, then press ENTER.*



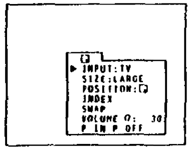
DEMONSTRATION
VIDEO CONTROL
AUDIO CONTROL
INTELLIGENT I/O
SLEEP:OFF
▶ P IN P
PRESET

3 *Move the red cursor to the item you want to set using Δ or ∇, then press ENTER.*

INPUT: → TV → VIDEO 1 → VIDEO 2 → VIDEO 3 → VIDEO 4 ┐

SIZE: → SMALL → LARGE ┐

POSITION: → ◲ → ◳ → ◰ → ◱ ┐



▶ INPUT:TV
SIZE:LARGE
POSITION:
INDEX
SWAP
VOLUME : 30
P IN P OFF

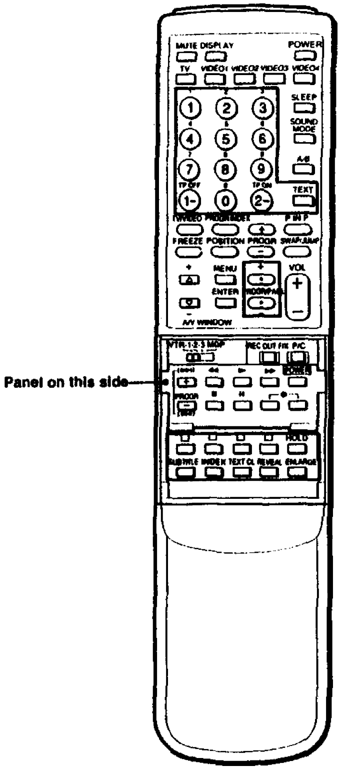
INDEX: Performed on the P IN P screen.
SWAP: Performed on the TV.
VOLUME: Adjust using Δ or ∇, then press ENTER.
P IN P OFF: The P IN P screen disappears.

Notes

- *When you display a VTR picture at speeds other than normal speed, such as fast-forward* playback, on the P IN P screen, the picture may be noisy depending on the VTR. The picture may be improved by selecting the "SMALL" size of the P IN P screen.
- You cannot hear the sound of the NICAM and German stereo/bilingual system program in the P IN P picture.
- *While fast-forwarding or reversing the picture of a PAL system signal on an 8 mm VTR, the* picture may be distorted.

Teletext

Buttons *for* teletext operation



TV stations broadcast an information service called Teletext via a TV channels. Teletext service allows you to receive various information pages such as weather reports or news at any time you want.

Switching Teletext on and off

1 Select the TV channels which carries the teletext broadcast you want to watch.
2 Press TEXT to switch on the teletext.
A teletext page will be displayed (usually the index page).
If there is no teletext broadcast, P100 is displayed at the top left corner of the screen.

To switch Teletext off

Press TV.

Superimposing a Teletext page on the TV picture (MIX mode)

Press TEXT.
Each time you press TEXT, the screen changes:

→ Teletext → Teletext and TV → TV ┐

Checking the contents of the Teletext

Press INDEX to have the overview of the contents of the teletext and page numbers.

Selecting a Teletext page

Use the number buttons to input the three digits of the page *number you want to turn on.*

If you have made a mistake, type in any three digits. Then re-enter the correct page number.

To access the next or preceding page, press PAGE + or PAGE –.

Holding a Teletext page

A teletext page may consist of several subpages. You can *stop the page scrolling in order to read the text at your own* pace.

Press HOLD.
The HOLD symbol " ⊞ " is displayed at the top left of the *screen.*
To resume normal teletext operation, press TEXT.

Enlarging the Teletext display

Press ENLARGE once to enlarge the upper half, twice to enlarge the lower half, and again to resume normal size.

Revealing concealed information

Sometimes pages contain concealed information, such as an answer to a quiz. The reveal option lets you disclose the information.

Press REVEAL.
To conceal the information, press REVEAL again.

Displaying subtitles

Press *SUBTITLE.*
To make the subtitle disappear, press SUBTITLE again.

Teletext

Waiting for Teletext page while watching the TV program
After requesting a page, press TEXT CLEAR.
When the page is available, the page number is displayed at the top left corner of the screen.
Press TEXT to switch the teletext on.

Displaying Teletext page at predetermined time

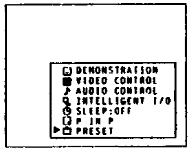
1 Request a time coded page (e.g. alarm page).
2 Press TP ON.
  "T****" appears at the bottom of the screen.
3 Enter your request time of four digits using the number buttons. For example, if you enter 0730, the indication will become "T0730".
4 To watch the TV program, press TEXT CLEAR.
5 At the requested time, the page number is displayed at the top left corner of the screen.
  To view the page, press TEXT.
  To cancel the page, press TP OFF.

Using Fastext
With Fastext you can access pages with one key stroke.
When a Fastext page is broadcast, a color-coded menu will appear at the bottom of the screen. The colors of this menu correspond to the RED, GREEN, YELLOW and CYAN buttons on the Remote Commander.
Press the color button which corresponds to the color-coded menu. The page will be displayed after some seconds.

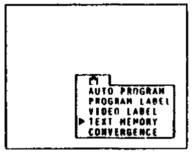
Switching to a Teletext page you want directly while watching a TV
Using the menu, you can set teletext pages you want so that you can switch to the pages directly while watching a TV by pressing a color button.

To set the page

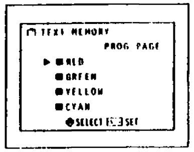
1 Press MENU.
2 Move the red cursor to "PRESET" using Δ or ∇, then press ENTER.



3 Move the red cursor to "TEXT MEMORY" using Δ or ∇, then press ENTER.



4 Move the red cursor to a color you want using Δ or ∇, then press ENTER.
  The colors correspond to the color of the buttons.



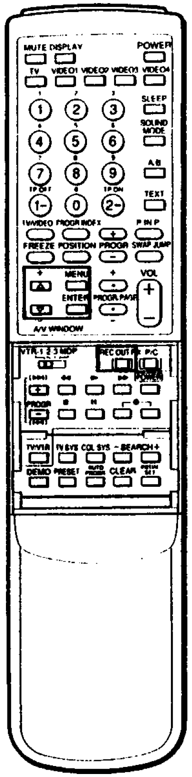
5 Press the program number button and press ENTER.
  For the program number 5, press "5".
  For the program number 25, press "2–" and "5".
6 Press the page number button of three digits and press ENTER.
  If you made a mistake, enter any three digits and then enter the correct three digits.
  If you want to cancel the operation, press "9" for the first digit.
7 Repeat steps 4 to 6 for other pages.
8 Press MENU to return to the TV display.

To view the page, press the color button of the page while watching the TV.

Note

The color buttons function as the FAST TEXT buttons in Teletext mode.

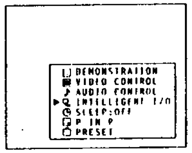
Selecting Input and Output



Using the INTELLIGENT I/O function, you can:
—record a source while watching the source.
—record a source while watching another source.
—record picture and sound from different sources.
—record a source while the TV is in standby mode.

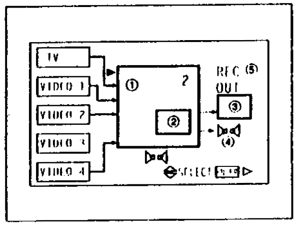
Setting the INTELLIGENT I/O

1 Press MENU.
2 Move the red cursor to "INTELLIGENT I/O" using Δ or ∇, then press ENTER.



DEMONSTRATION
VIDEO CONTROL
AUDIO CONTROL
▶ INTELLIGENT I/O
SLEEP:OFF
P IN P
PRESET

3 Select the item using Δ or ∇, then press ENTER.
The color of the box or speaker mark becomes the color of the source selected.
① Select the source to watch on the TV.
② Select the source to be displayed on the P IN P screen.
③ Select the video to be recorded.
④ Select the sound to be recorded.
⑤ Make REC OUT in red or in white.
Red: The REC OUT FIX is on. The REC OUT FIX lamp lights. The recording source is fixed, therefore, even if you change the source to watch, the recording source does not change.
White: The REC OUT FIX is off. The REC OUT FIX lamp is off. The recording source changes accordingly when you change the source to watch.



4 Press MENU to go back to the normal TV picture.

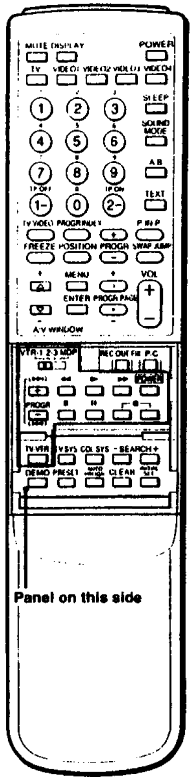
To change the program or video input after recording has started, or to turn off the TV (standby)
- If you did not make "REC OUT" in red on the INTELLIGENT I/O page (the REC OUT FIX lamp is not lit), press REC OUT FIX on the Remote Commander.
- If you made "REC OUT" in red (the REC OUT FIX lamp is lit), you do not need any operation.

When you set the INTELLIGENT I/O the next time
Make the "REC OUT" in white, if it is in red.

Notes
- After you started recording, do not turn off the TV by pressing the POWER switch of the TV. The recording stops.
- If you call the INTELLIGENT I/O page while watching the TV, the P IN P is displayed. To turn P IN P off, press P IN P.
- If you change TV program while recording a TV program, the newly selected TV program is recorded, even if you set the REC OUT FIX to on.

Remote Control of Other Sony Equipment

Buttons for VTR operation



You can use the TV Remote Commander to control other remote-controlled video equipment such as Beta, 8mm, VHS VTRs or multi disc players.

Tuning the Remote Commander to the equipment
1 Set the VTR 1-2-3-MDP selector according to the equipment you want to control.
VTR 1: Beta or ED Beta VTR
VTR 2: 8mm VTR
VTR 3: VHS VTR
MDP: Multi disc player

2 Use the buttons indicated in the illustration to operate the additional equipment.

If your video equipment is furnished with a COMMAND MODE selector, set this selector to the same position as the VTR 1-2-3-MDP selector on the TV Remote Commander.

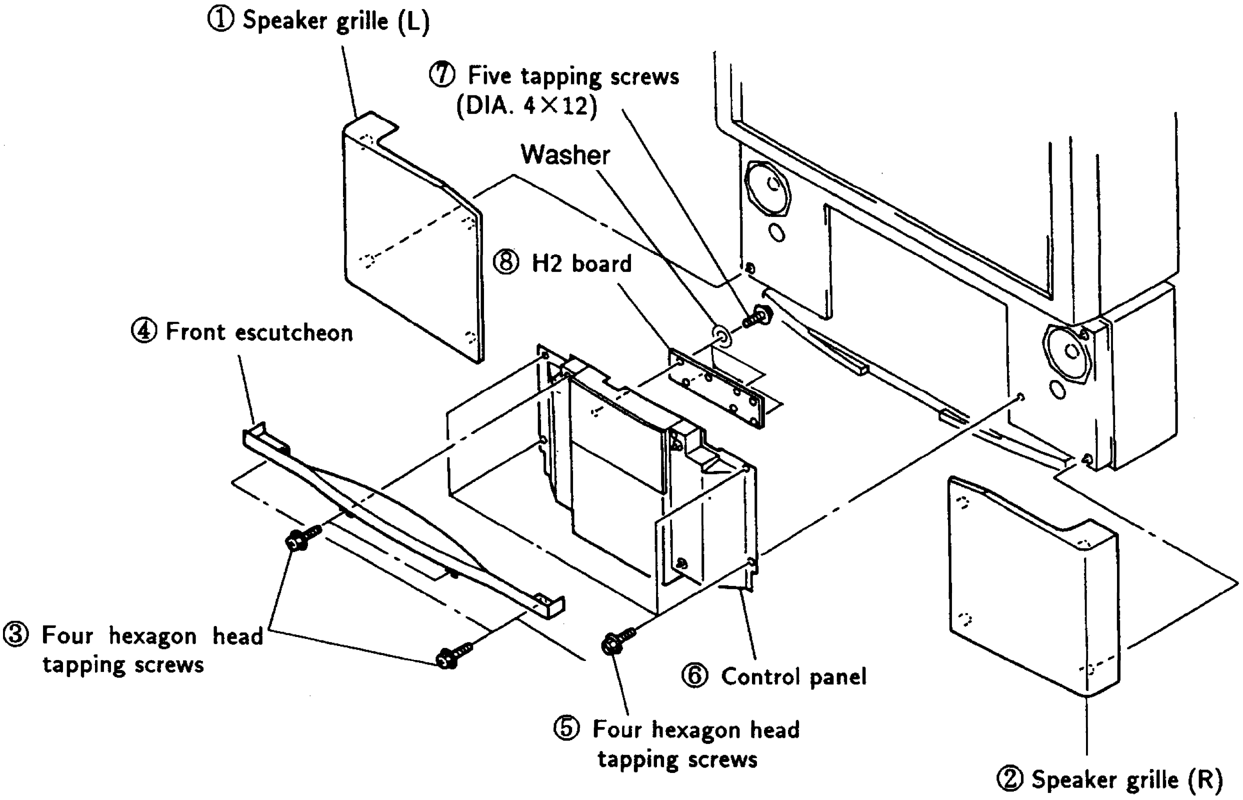
If the equipment does not have a certain function, the corresponding button on the Remote Commander will not operate.

When recording
When you use the ● (record) button, make sure to press these two buttons simultaneously.

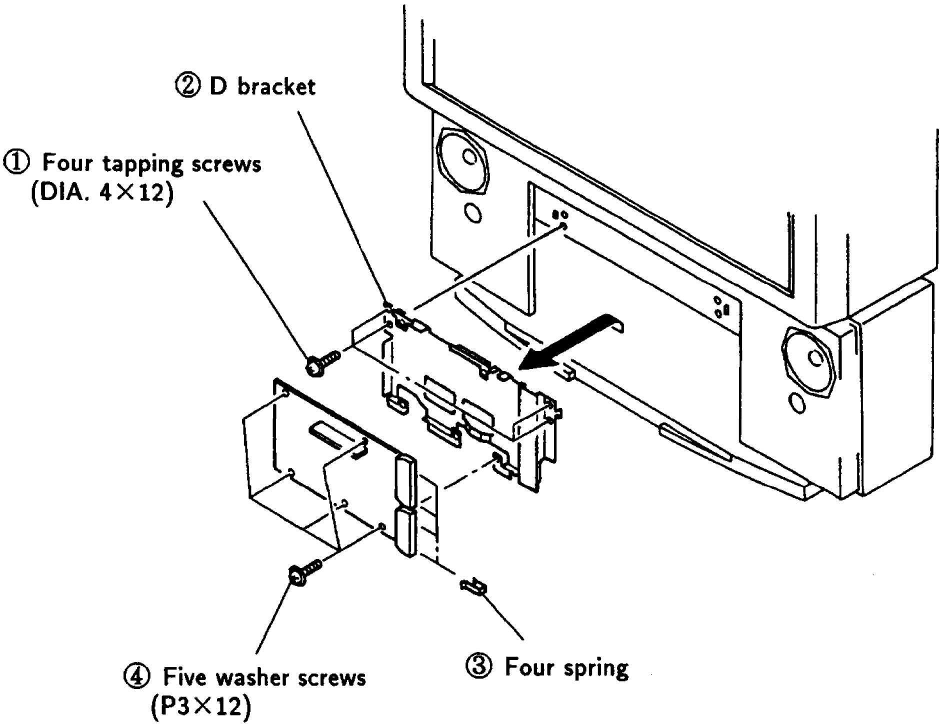
SECTION 2

DISASSEMBLY

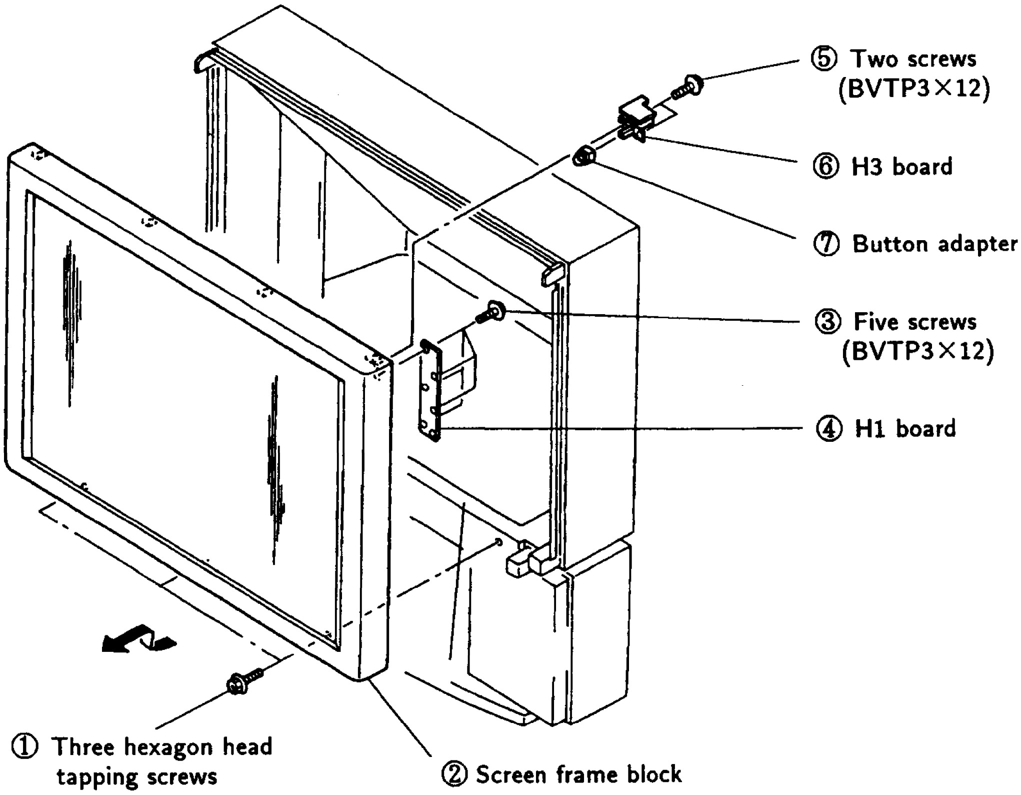
2-1. H2 BOARD REMOVAL


① Speaker grille (L)
⑦ Five tapping screws (DIA. 4×12)
Washer
⑧ H2 board
④ Front escutcheon
③ Four hexagon head tapping screws
⑥ Control panel
⑤ Four hexagon head tapping screws
② Speaker grille (R)

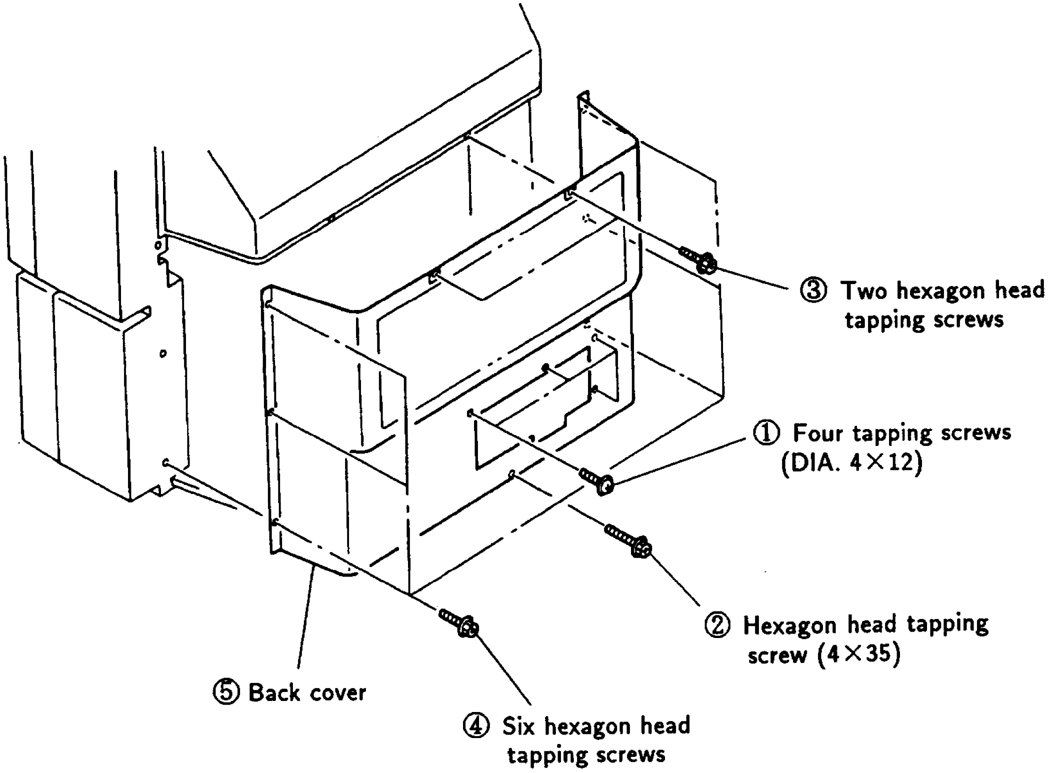
2-2. D BOARD REMOVAL


② D bracket
① Four tapping screws (DIA. 4×12)
④ Five washer screws (P3×12)
③ Four spring

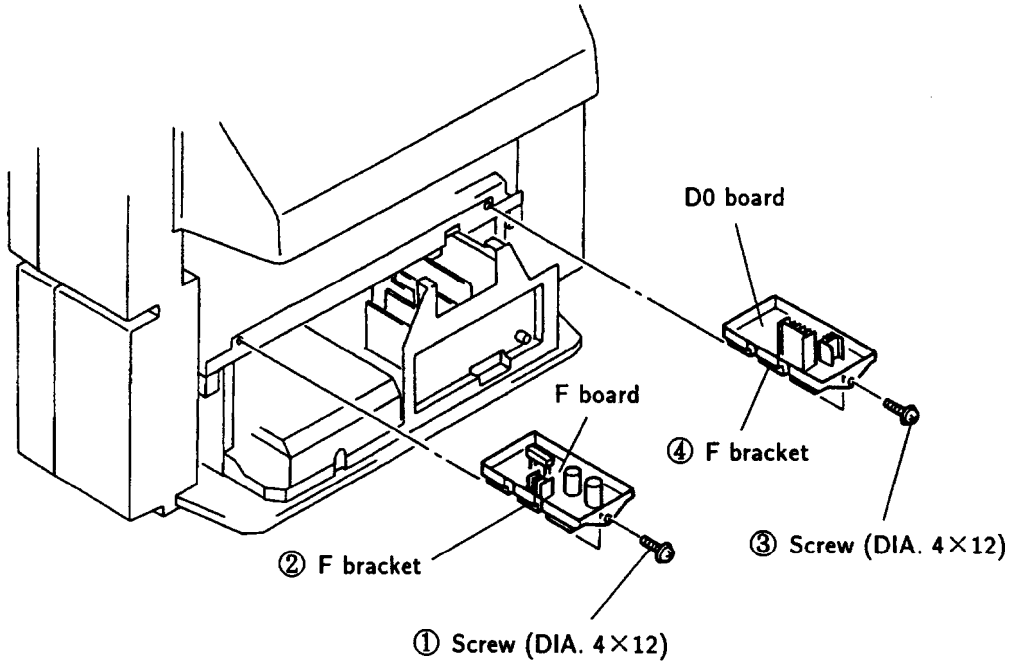
2-3. H1 AND H3 BOARDS REMOVAL



2-4. BACK COVER REMOVAL

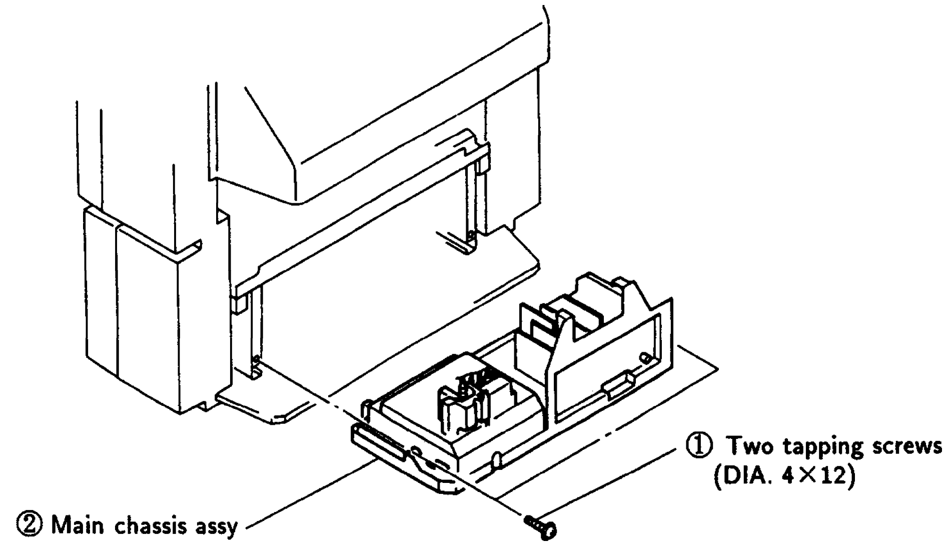

③ Two hexagon head tapping screws
① Four tapping screws (DIA. 4×12)
② Hexagon head tapping screw (4×35)
⑤ Back cover
④ Six hexagon head tapping screws

2-5. F BRACKET REMOVAL

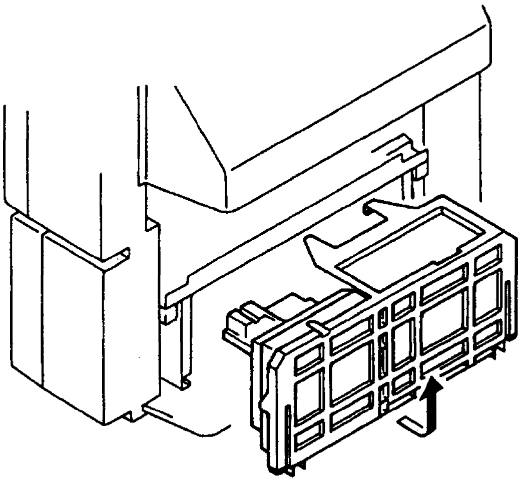


2-6. MAIN CHASSIS ASSY REMOVAL AND SERVICE POSITION

(1) MAIN CHASSIS ASSY REMOVAL



(2) SERVICE POSITION



NOTES INSERTED IN SERVICE POSITION SECTION

Service Position Procedure

1) Remove the path locks where the harness comes into. (MAIN bracket, G shield)
2) Remove the following connectors before removing the main bracket.
   ※ HV grounding lead, G shield grounding lead, V-2 connector (V board).
3) Remove the main bracket. (Take care as the connector leads linking to the C and Z boards are considerably short).
4) Before power ON, be sure to connect the connectors removed.
   ※ HV grounding lead, G shield grounding lead.

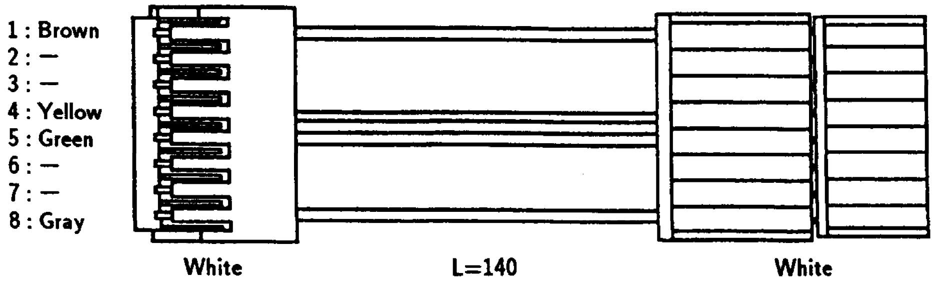
In case that grounding lead (Black) of HV Block is not connected with chassis grounding, it causes arcing of CRT and it is dangerous.

Be sure to connect grounding lead of HV Block with chassis grounding.

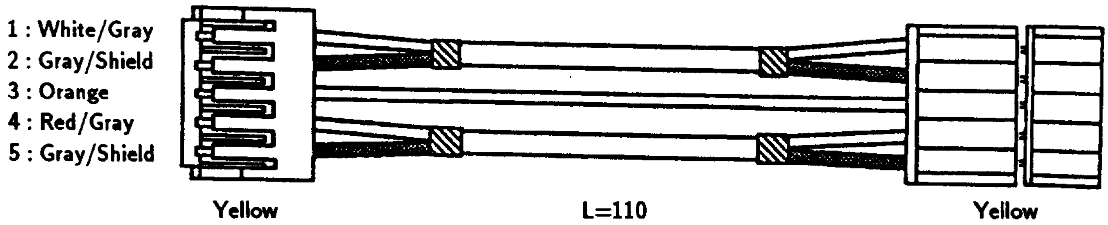
(3) CONNECTOR CABLES

※ In order to put the set in the service position, use the extension connector cables below.

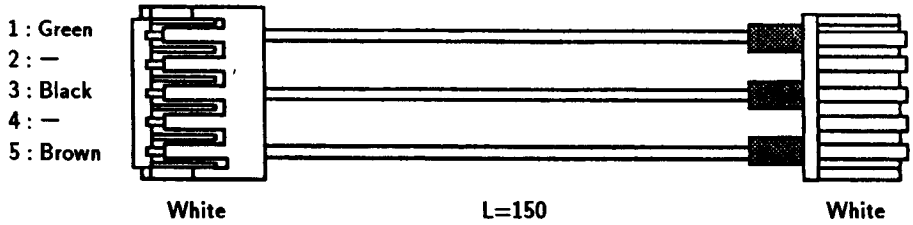
Parts No.	Connection
1-941-897-38	CB-4toCN1652(G BOARD)



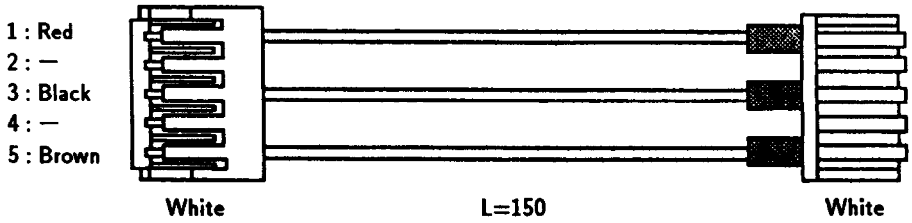
Parts No.	Connection
1-941-897-39	CG-16toCN1608(A BOARD)



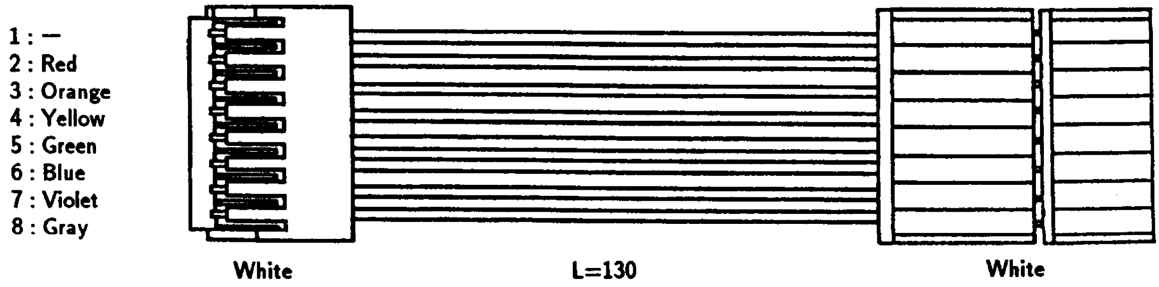
Parts No.	Connection
1-941-897-40	ZG-19toCN1308(DO BOARD)



Parts No.	Connection
1-941-897-41	ZR-18toCN1306(DO BOARD)

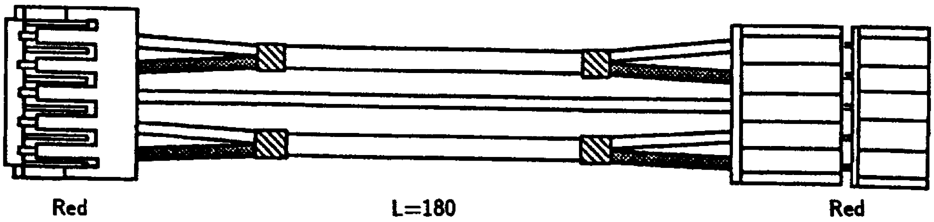


Parts No.	Connection
1-941-897-42	ZG-2toD-2



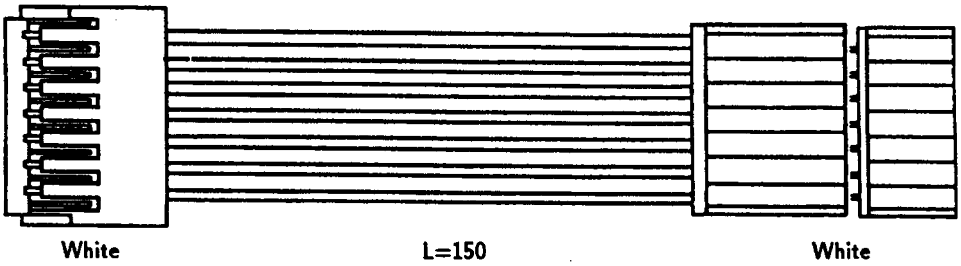
Parts No.	Connection
1-941-897-43	CR-15toCN1609(A BOARD)

1 : White/Gray
2 : Gray/Shield
3 : Orange
4 : Red/Gray
5 : Gray/Shield



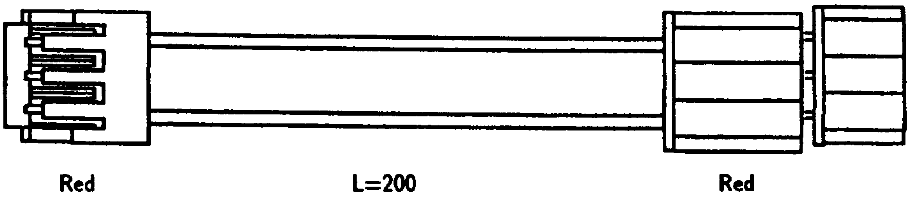
Parts No.	Connection
1-941-897-44	ZR-1toD-1

1 : Brown
2 : Red
3 : Orange
4 : Yellow
5 : Green
6 : Blue
7 : Violet

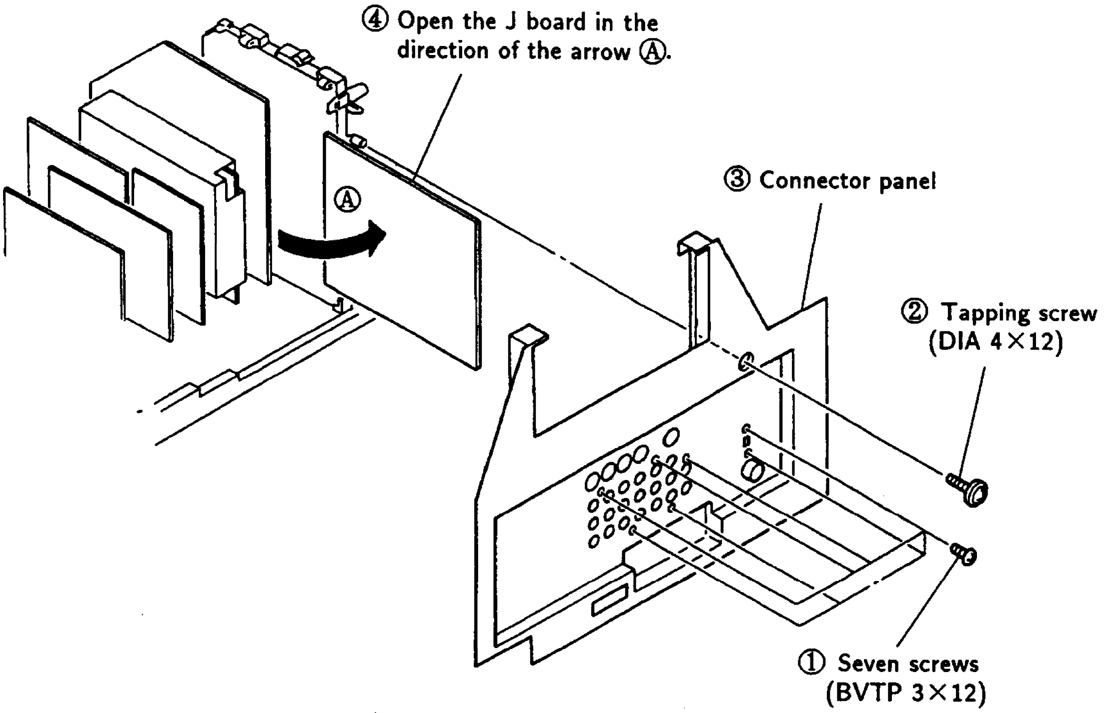


Parts No.	Connection
1-941-897-46	CN515 (A BOARD) to ZG-3

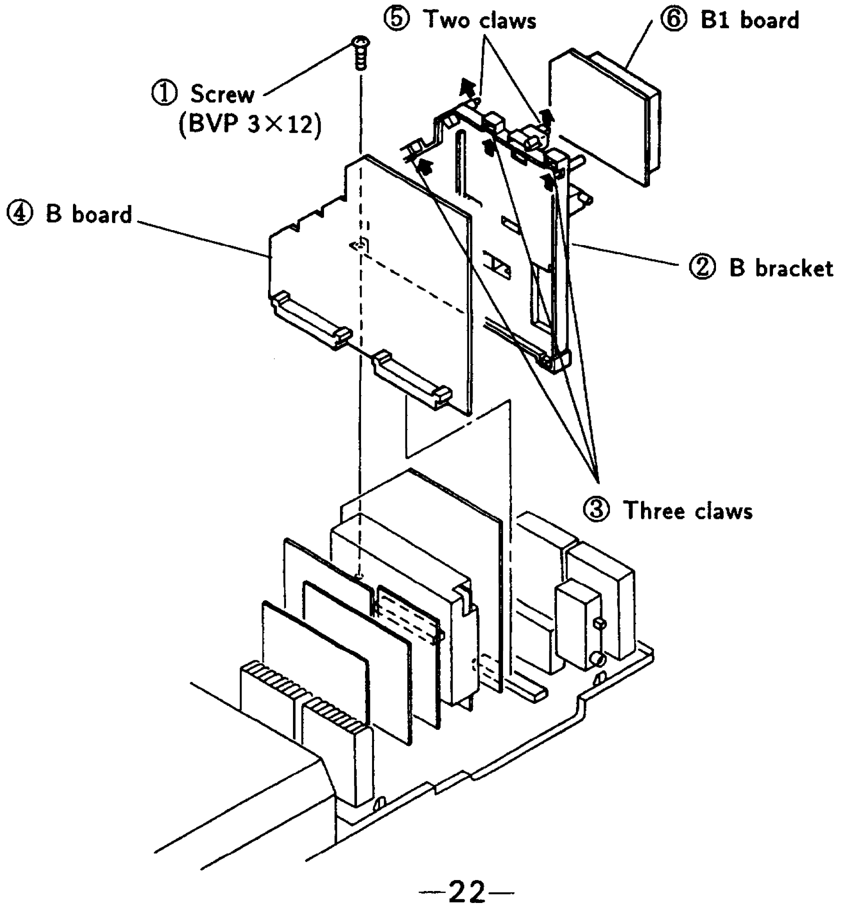
1 : Brown
2 : —
3 : Red



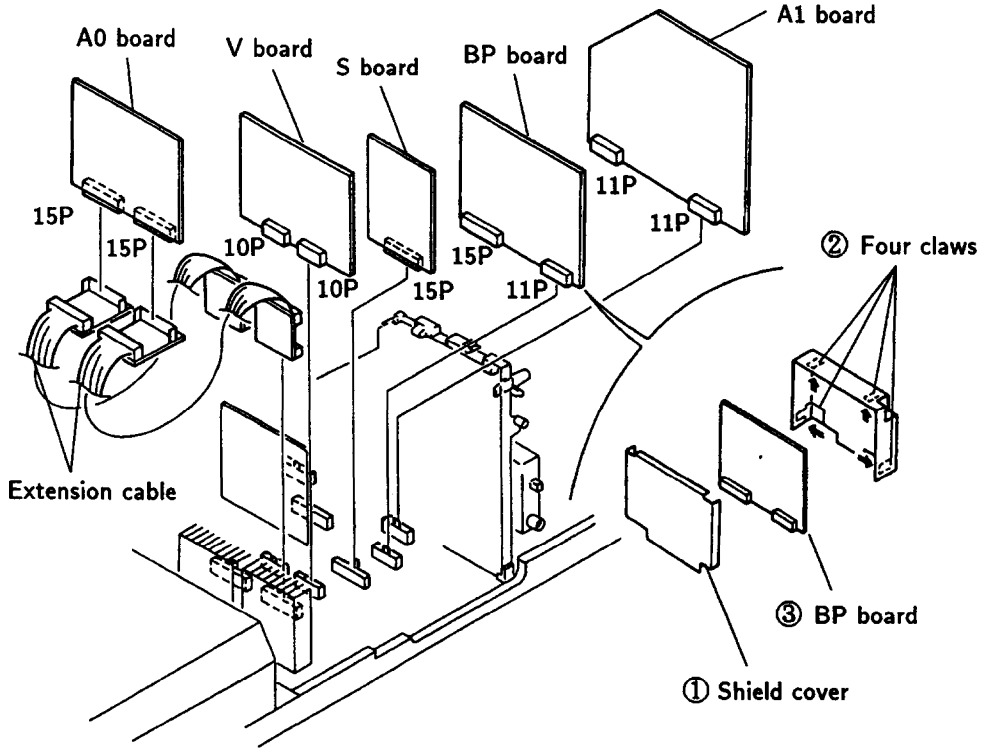
2-7. J BOARD REMOVAL


④ Open the J board in the direction of the arrow Ⓐ.
Ⓐ
③ Connector panel
② Tapping screw (DIA 4×12)
① Seven screws (BVTP 3×12)

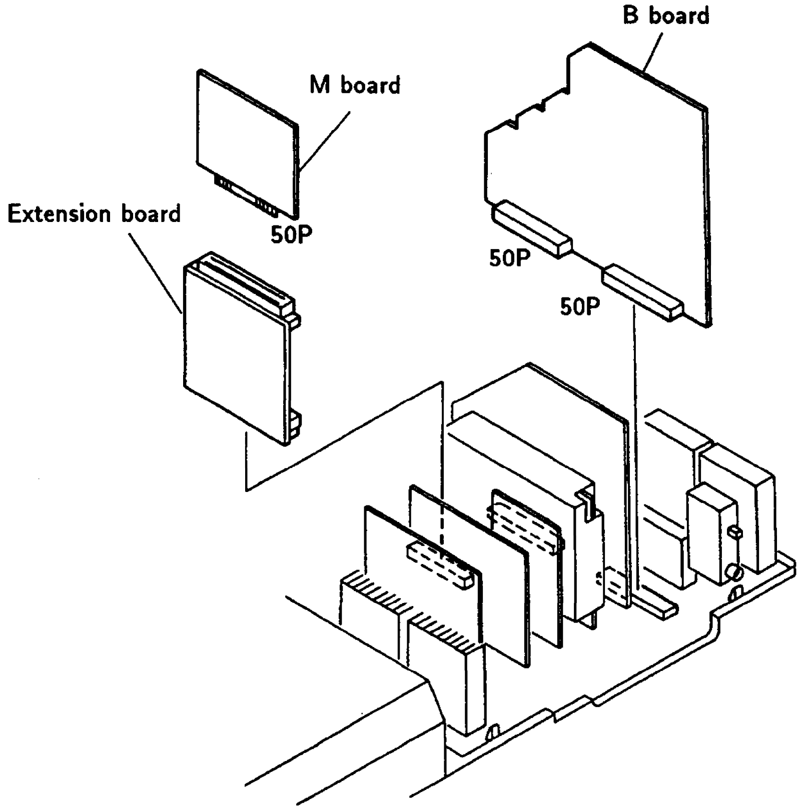
2-8. B AND B1 BOARDS REMOVAL



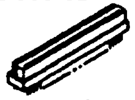
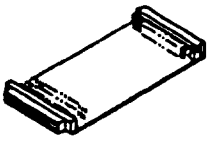
2-9. EXTENSION CABLE



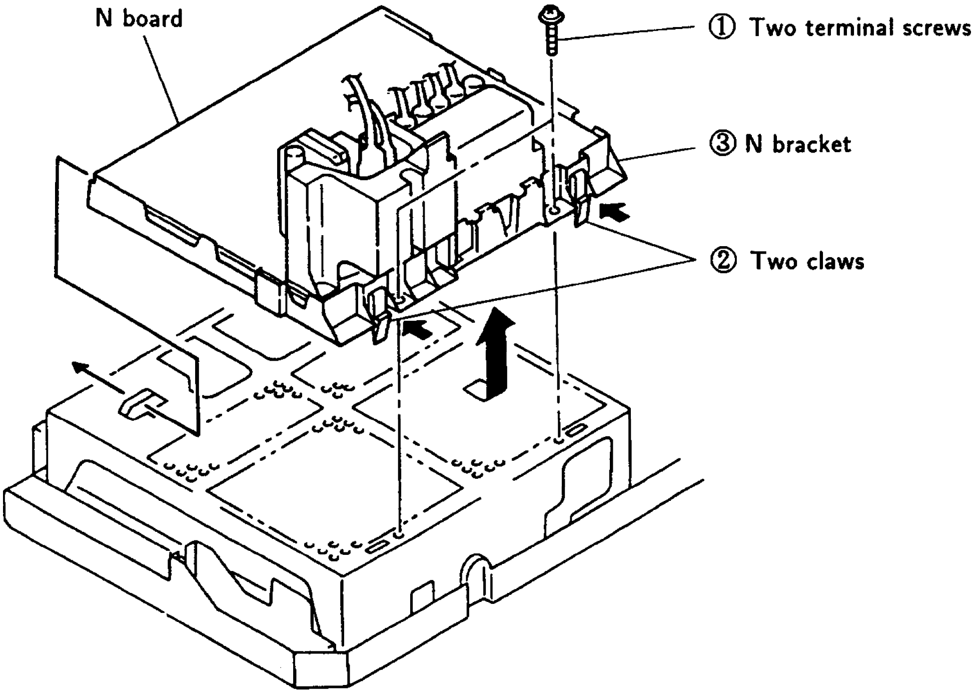
2-10. EXTENSION BOARD



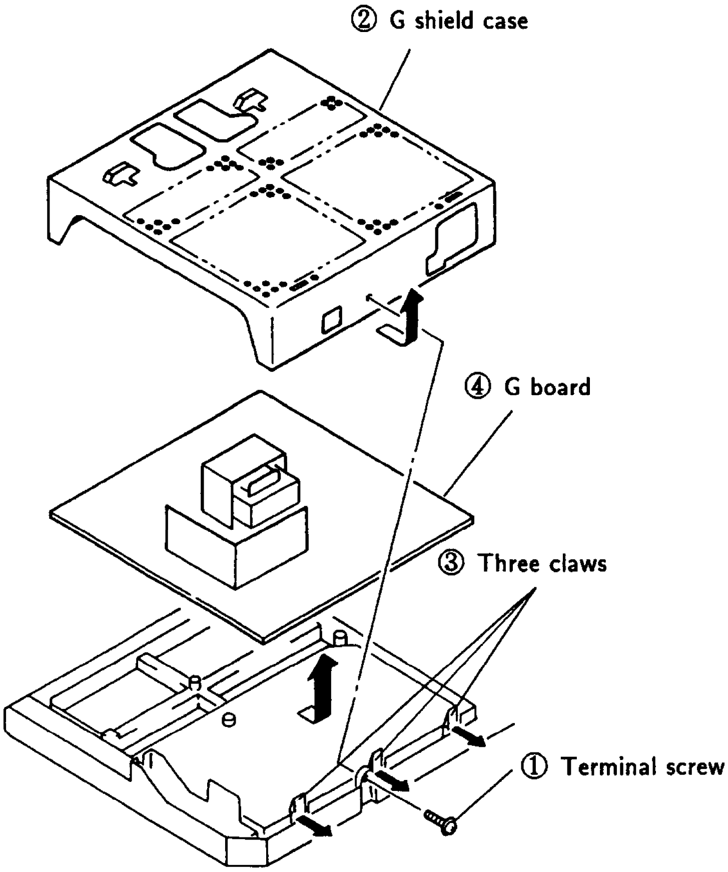
EXTENSION CABLES AND EXTENSION BOARDS LIST

B board	3-702-556-01	50P	2
V board	3-702-108-01	10P	1
A1 board	3-702-564-01	11P	2
BP board	3-702-564-01	11P	1
	3-702-565-01	15P	1
S board	3-702-565-01	15P	1
A0 board	3-702-565-01	15P	2
M board	3-702-560-01  50pin connector		
	3-702-556-01  Extension board		

2-11. N BRACKET REMOVAL

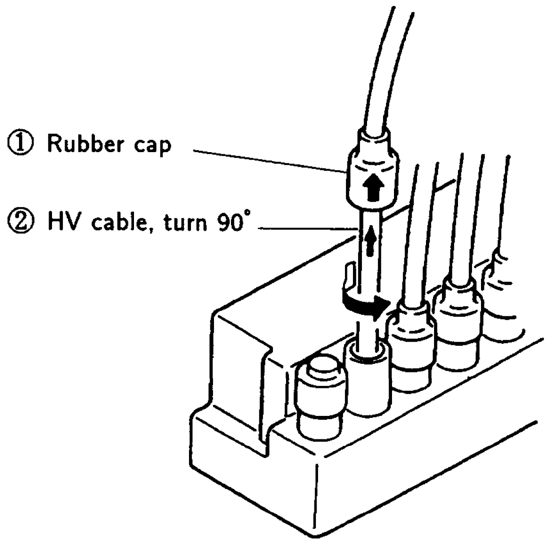


2-12. G BOARD REMOVAL

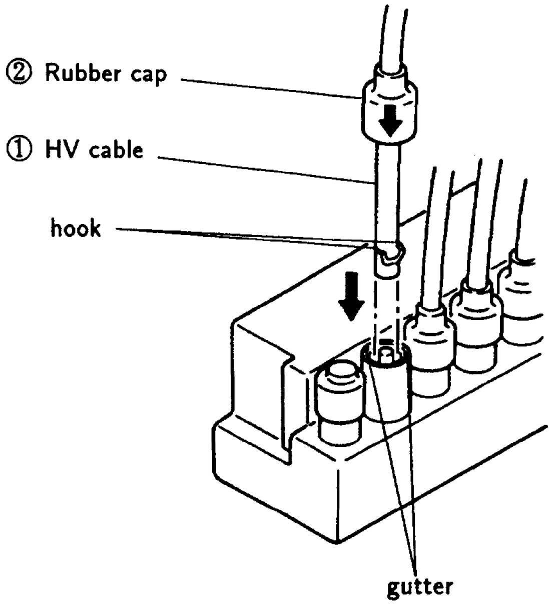


2-13. HIGH-VOLTAGE CABLE INSTALLATION AND REMOVAL

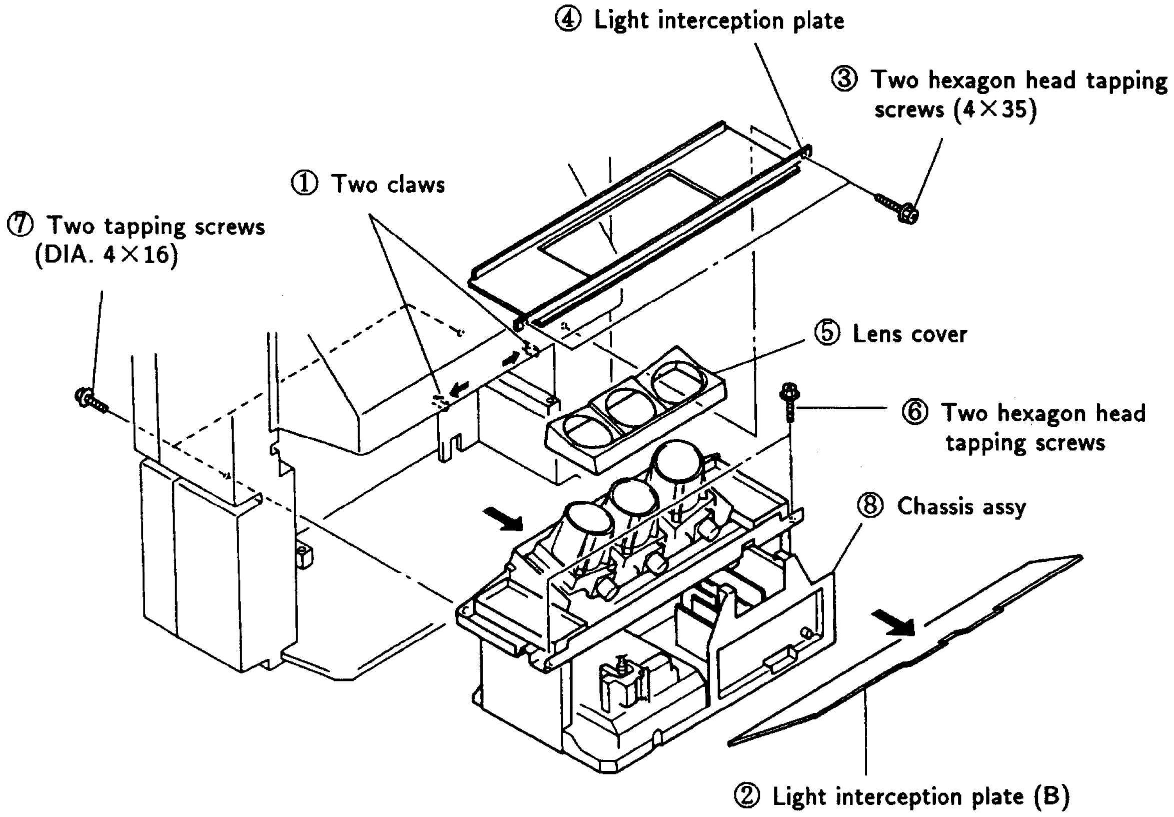
(1) Remover



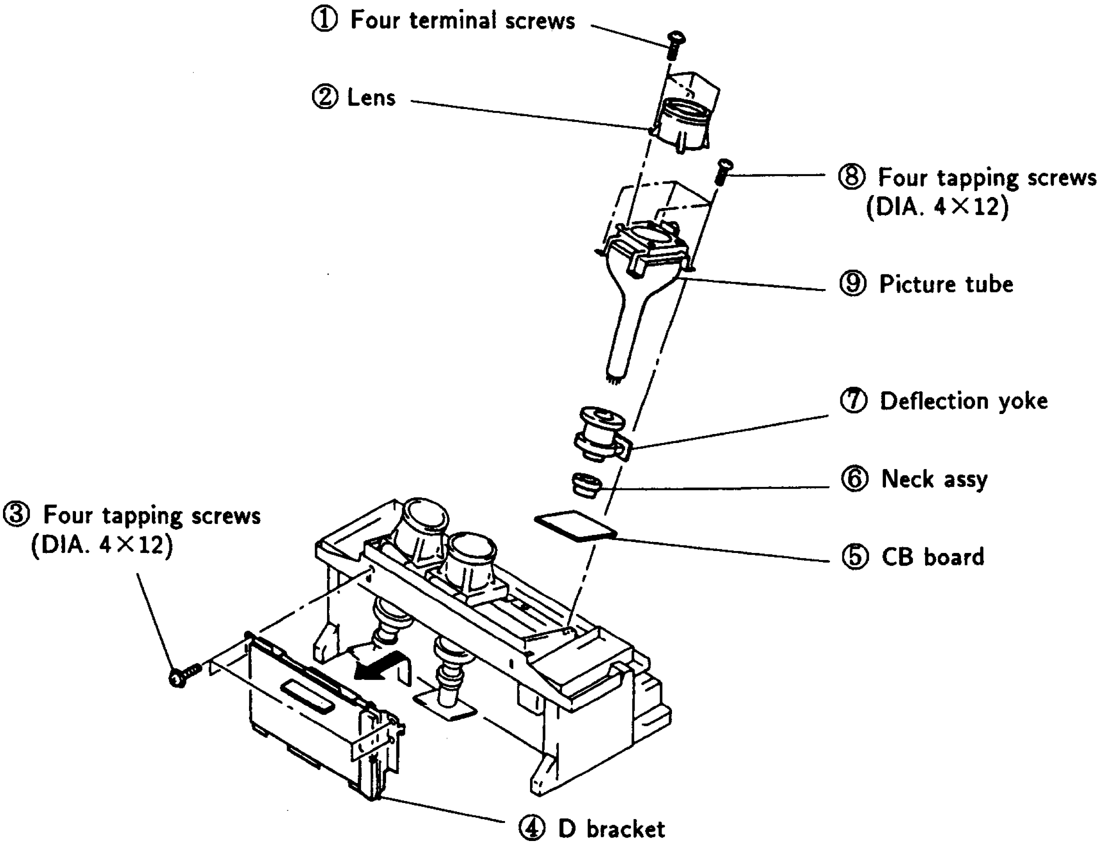
(2) Installation



2-14. CHASSIS ASSY REMOVAL


④ Light interception plate
③ Two hexagon head tapping screws (4×35)
① Two claws
⑦ Two tapping screws (DIA. 4×16)
⑤ Lens cover
⑥ Two hexagon head tapping screws
⑧ Chassis assy
② Light interception plate (B)

2-15. PICTURE TUBE REMOVAL



2-16. REPAIR OF CHIP COMPONENT CIRCUIT BOARD

2-16-1. POINTS OF COMPONENT REMOVAL

Handing of blower type soldering iron

If hot blast is too strong or applied from a slanting direction, small components and solder near the component being removed can be blown off. Do not use blower type without temperature control.

2-16-2. NOTES ON SOLDERING FOR CHIP COMPONENTS

1) During soldering a chip component, if a soldering iron is applied for a long time, the heat may damage the component or cause pattern peeling.
2) Do not reuse a removed component. The characteristics of such a component may deteriorate.
3) Use wire solder containing silver (ϕ 0.3 or ϕ 0.6). (The pin electrodes of the laminated chip capacitor are silver +palladium, so if wire solder which does not contain silver is used, the silver of the pin electrode will be sucked into the solder.)

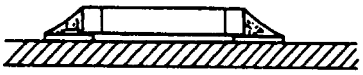
2-16-3. REMOVAL AND MOUNTING OF COMPONENTS

Chip resistor and chip capacitor

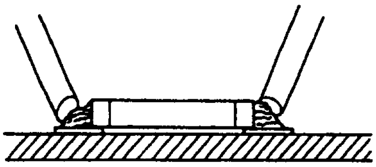
REMOVAL

- Using two soldering irons

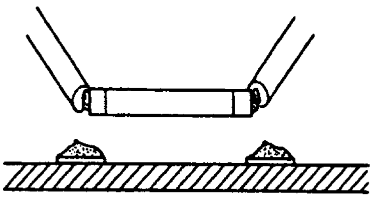
1) Mounted state



2)Melt the solder.

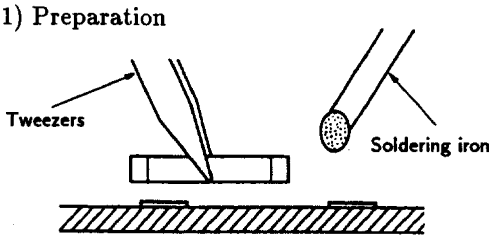


3)Remove the component.



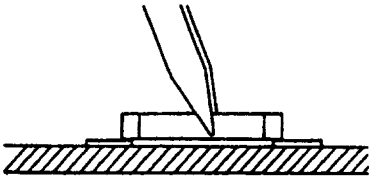
SOLDERING

1) Preparation

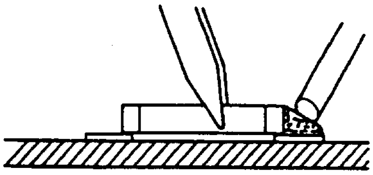


2) Location

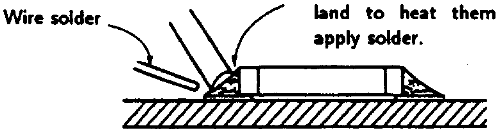
Be careful not to misposition.



3) Tack soldering and flux application

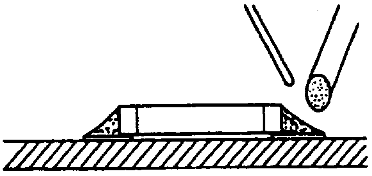


4) Soldering



Apply the soldering iron to the chip component and land to heat them and apply solder.

5) Soldering (Fix the fillet.)



6) Visual inspection

Check for the following defects :

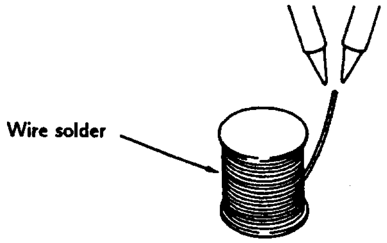
- No-soldered part
- Bridge (to other components or lands)
- Mispositioning
- Other defects

2-16-4. MINI-TRANSISTOR

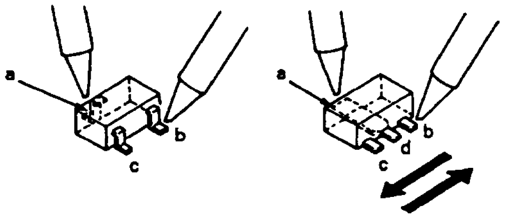
REMOVAL

- Using two soldering irons

1) Put a little solder on the tip of two soldering irons.

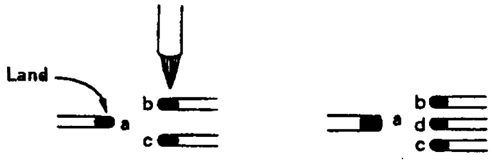


2) Apply the tip of one soldering iron to the point "a" and the other to the points "b" → "c" (or "b" → "d" → "c") and move the component in the directions indicated by arrows in the figure to remove it.

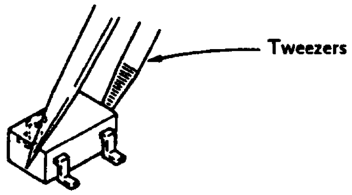


MOUNTING

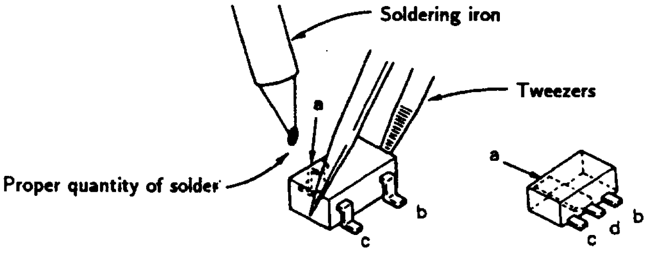
1) Apply a little flux to the land with a brush.



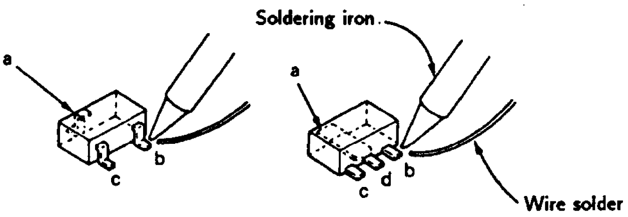
2) Place the component in position using tweezers.



3) Put a little solder on the tip of the soldering iron and solder the point "a" to fix the component.

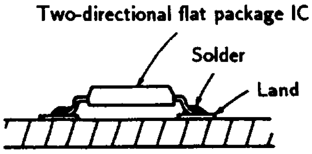


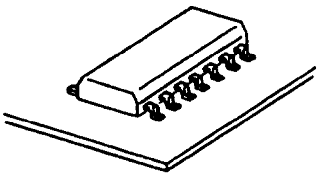
4) Bring the tip of the soldering iron and the wire solder close to the point to be soldered. Solder the points "b" → "c" (or "b" → "d" → "c") in order.



2-16-5. TWO-DIRECTIONAL FLAT PACKAGE IC

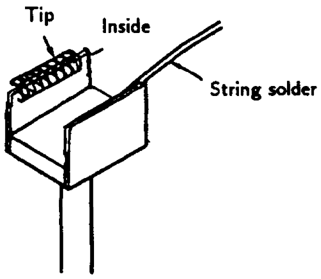
MOUNT CONDITION



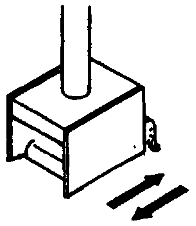


REMOVAL

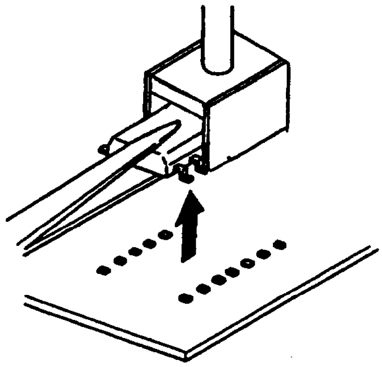
1) Apply some solder on the inside and the tip of the iron tip jig.



2) Place the iron tip jig over the IC, and move the jig to and fro as shown in the figure.

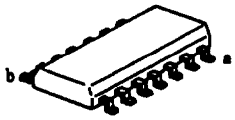


3) When the solder melts, lift the IC with a pair of tweezers and remove.

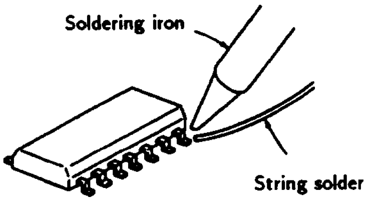


INSTALLATION

1) Place the two-directional flat package IC at the appointed position, solder pins a and b on the diagonal, and fasten it.

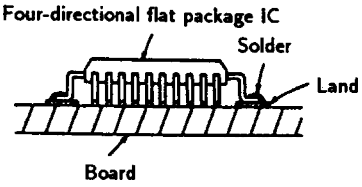


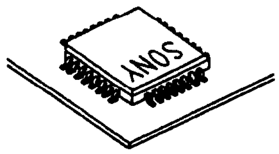
2) Solder the remaining pins with the soldering iron.



2-16-6. FOUR-DIRECTIONAL FLAT PACKAGE IC

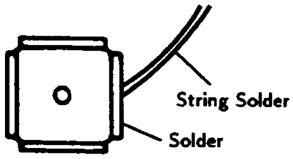
MOUNT CONDITION



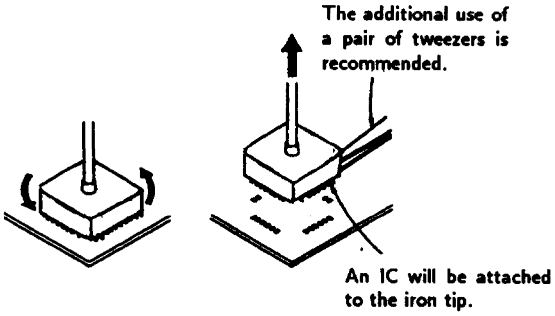


REMOVAL

1) Apply solder on the tip of the iron tip jig.



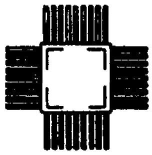
2) Place the iron tip jig over the IC, wait about two to three seconds, rotate the iron slightly and lift it up.


The additional use of a pair of tweezers is recommended.
An IC will be attached to the iron tip.

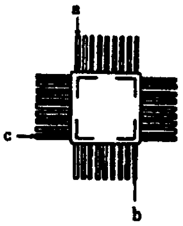
Note : For flat ICs of above 52P, the IC may not be completely attracted when the iron tip jig is lifted up. In these cases, use a pair of tweezers to remove.

INSTALLATION

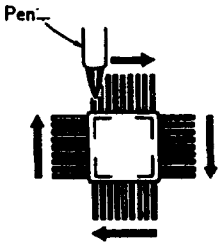
1) Place the four-directional flat package IC at the appointed position.



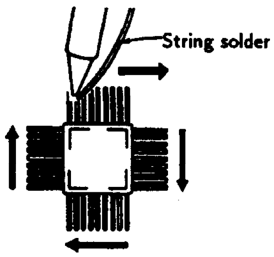
2) Apply a slight amount of solder on the iron tip, and solder the three sections in the order of a → b → c, and fix.



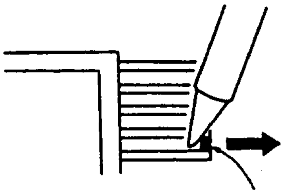
3) Apply a slight amount of flux with a pen on all four directions.



4) Apply solder on the iron tip and the string solder, and slide and solder in the directions of the arrows.



Note : 1) After soldering, if there are bridged sections, correct by sliding the soldering iron in the direction of the arrow.



If the bridges cannot be corrected using the above method, apply some flux with a pen and try again.

2) Soldering can be carried out more easily by sliding the iron tip near the tip of the IC leg. (Fig. A)

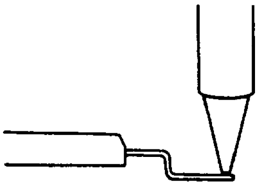


Fig. A

Be careful not to slide the bent sections of the leg as shown in Fig. B as soldering bridges will be formed.

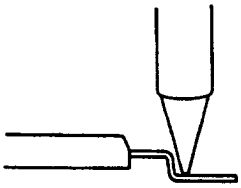


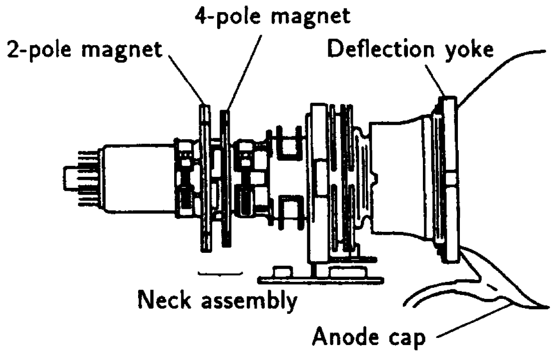
Fig. B

SECTION 3

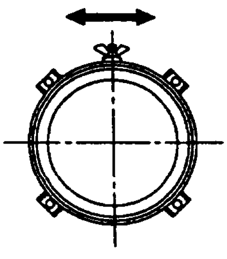
SETUP ADJUSTMENTS

3-1. FOCUS LENS ADJUSTMENTS

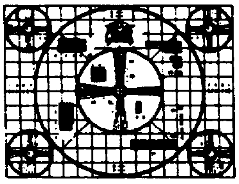
1. Set the D-board registration variable resistor (VR) and the position VR (CENTER VR) to mechanical.
2. Set the centering magnets (for red, green, and blue) to 0 as shown in the figure.

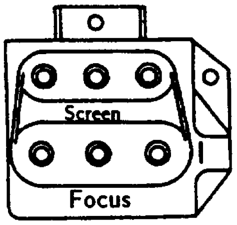


3. Input monoscope signal. Set 50% BRIGHTNESS and minimum PICTURE. Make rough adjustment so that 10IRE of the monoscope signal becomes faintly luminous.
4. Set PICTURE and BRIGHTNESS maximum. Press the commander menu button. Select CONVERGENCE to display test signal.
5. Enter service mode. Select R OFF of SERVICE MODE to cut off red output.
   Similarly, select B OFF to cut off blue output.
6. Turn the green lens to eliminate flare of the test signal.

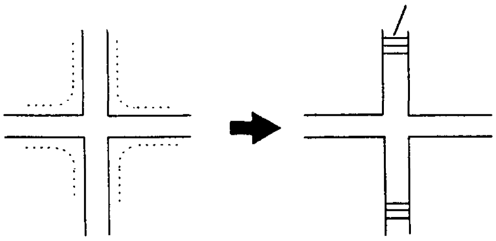


(Lens)



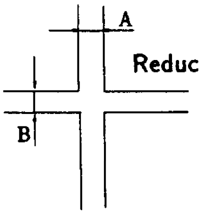


(Focus block)



Verify that scanning lines are seen.

7. Turn the green focus VR in the focus block to adjust green focus to reduce both A and B of the test signal to minimum.



Reduce both A and B to minimum.

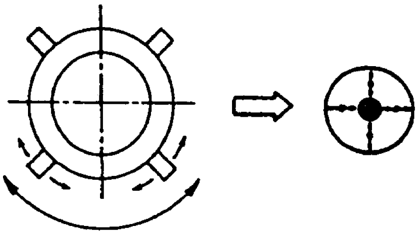
8. Repeat avobe 7. Couple of times to improve tracking and obtain an optimum lens focus. Then tighten the lens screws.

3-2. DEFLECTION YOKE POSITION ADJUSTMENTS

1. Input monoscope signal.
2. Enter service mode. Select R OFF of SERVICE MODE to cut off red output.
   Similarly, select B OFF to cut off blue output.
3. Loosen the deflection yoke (DY) fitting screws. Tilt the DY to obtain the best horizontal and vertical monoscope patterns.
4. After adjustment, press the DY onto the cathode ray tube (CRT) funnel and tighten the screws.
5. Also adjust DY positions for red and blue outputs in the same way.

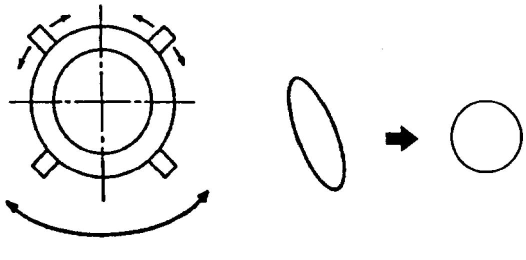
3-3. 2-POLE MAGNET ADJUSTMENT

1. Input dot signal.
2. Enter service mode. Select R OFF of SERVICE MODE to cut off red output.
   Similarly, select B OFF to cut off blue output.
3. Set PICTURE to maximum. Turn the green focus variable resistor (VR) in the focus block counterclockwise to brighten the point in the dot.
4. Adjust the 2-pole magnet to position the bright point at the center of the dot.
5. Adjust the red and blue dots in the same way.



3-4. 4-POLE MAGNET ADJUSTMENT

1. Input dot signal.
2. Enter service mode. Select R OFF of SERVICE MODE to cut off red output.
   Similarly, select B OFF to cut off blue output.
3. Set PICTURE to maximum. Turn the green focus variable resistor (VR) in the focus block clockwise until the dot diameter becomes 15 mm to 20 mm.
4. Adjust the 4-pole magnet to make the dot perfectly round.
5. Adjust the red and blue dot in the same way.



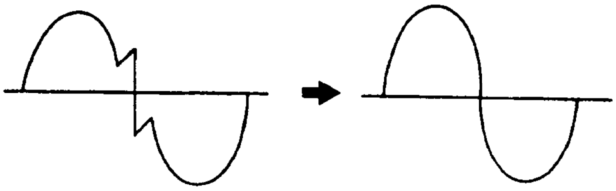
3-5. Ds ADJUSTMENT

1) HORIZONTAL WAVE ADJ.

1. Input a PAL color bar signal.
2. Connect the oscilloscope to pin① of IC1712 on Ds board.
3. Adjust RV984 (horizontal wave) of the waveform.

2) VERTICAL WAVE ADJ.

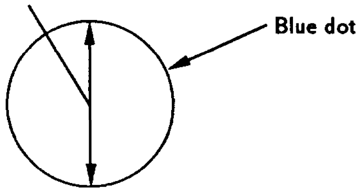
1. Input a PAL color bar signal.
2. Connect the oscilloscope to pin⑦ of IC1712 on Ds board.
3. Adjust RV983 (vertical wave) of the waveform.



3-6. DE-FOCUS ADJUSTMENT (BLUE)

1. Input dot signal.
2. Turn the blue focus variable resistor (VR) in the focus block counter clock wise so that the diameter of the blue dot becomes 10±1mm.

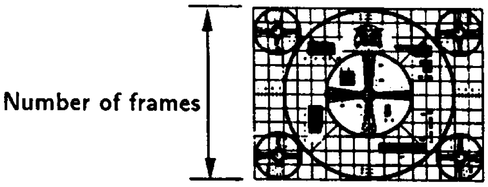
46" : MAX 10mm
53" : MAX 11mm



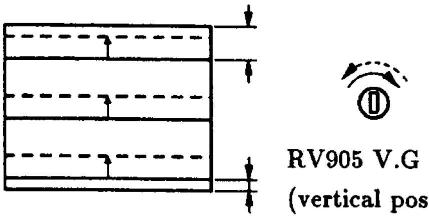
*Adjust as confirm that the blue dot of TEXT picture.

3-7. GREEN PICTURE ADJUSTMENTS

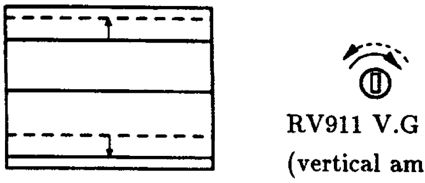
1. Input monoscope signal.
2. Enter service mode. Select R OFF of SERVICE MODE to cut off red output.
   Similarly, select B OFF to cut off blue output.
3. Turn RV913 and RV960, the vertical green linearity variable resistors (V.G LIN VRs) on the D-board, to obtain an optimum vertical linearity. Then turn RV911, the vertical green amplitube variable resistor (V.G SIZE VR) to set vertical amplitude to 11.2±0.2 flames.
   Note: The vertical position indicator of the monoscope signal must be positioned at the center by adjusting RV905, the vertical green center position variable resistor (V.G CENT VR) in advance.



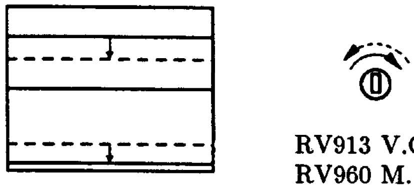
Monoscope signal



RV905 V.G CENT
(vertical position)

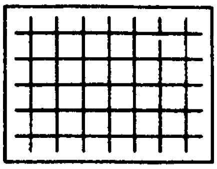


RV911 V.G SIZE
(vertical amplitude)

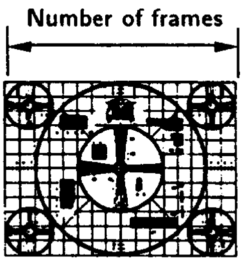


RV913 V.G LIN
RV960 M. LIN. S

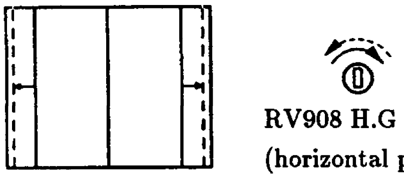
4. Verify that the horizontal lines on the top and bottom of cross-hatched area of the monoscope signal are horizontal and linear.



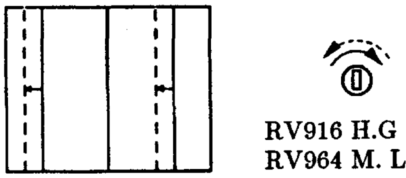
5. Turn RV916, RV964 and RV969, the horizontal green linearity variable resistors (H.G LIN VRs) on the D-board, to obtain an optimum horizontal linearity.
   Then turn RV908, the horizontal green amplitude variable resistor (H.G SIZE VR) to set horizontal amplitude to 14.8±0.2 frames.
   Note: The horizontal position indicator of the monoscope signal must be positioned at the center by adjusting RV902, the horizontal green center position variable resistor (V.G CENT VR) in advance.



Monoscope signal



RV908 H.G SIZE
(horizontal position)



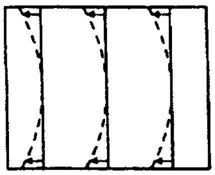
RV916 H.G LIN
RV964 M. LIN. S
RV969 M. LIN. L
(horizontal linearity)

6. Input cross hatch signal.
Turn vertical green (V.G) and horizontal green (H.G) variable resistors (VRs) and make adjustments according to the following steps.

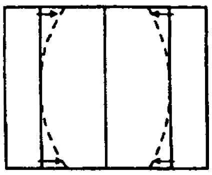
(Adjustment procedure)

1. [BOW] → [SKEW] → [CENT (center position)]
2. [PIN (pin warp)] → [SUB BOW] → [BOW]
3. [KEYS (trapezoid)] → [SUB SKEW] → [SKEW]
4. [M.WAVE (middle sine wave warp)] → [WAVE-A (upper and lower sine wave warp)] → [WAVE-U (upper sine wave warp)]
   ※ For vertical (V) only.
5. [V-M.PIN (vertical middle pin warp)] → [V/WING (vertical wing warp)]
   ※ For vertical (V) only.
6. [H-M.PIN (horizontal middle pin warp)]
   ※ For horizontal (H) only.

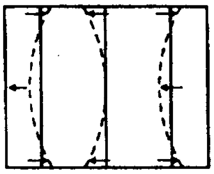
(Dot motion)



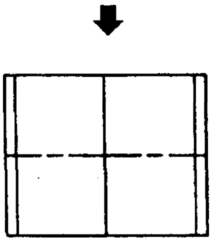
RV932 H.G BOW
(horizontal green bow)



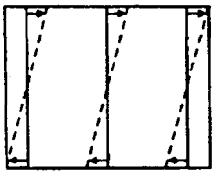
RV941 H.G PIN
(horizontal green pin warp)



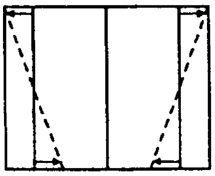
RV950 H.G SUB BOW
(horizontal green sub bow)



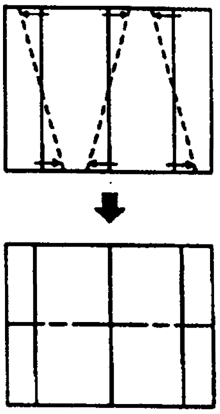
V.G BOW	....	RV935
V.G PIN	....	RV938
V.G SUB BOW	....	RV953



RV920 H.G SKEW
(horizontal green skew)

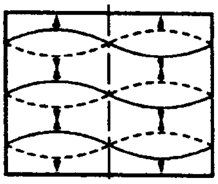


RV925 H.G KEYS
(horizontal green trapezoid)

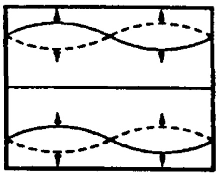


RV944 H.G SUB SKEW
(horizontal green sub skew)

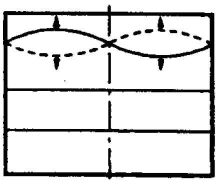
V.G SKEW	RV923
V.G KEYS	RV929
V.G SUB SKEW	RV947



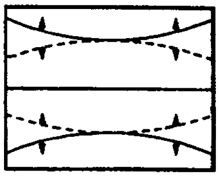
RV962 V-M-WAVE
(vertical middle sine wave warp)



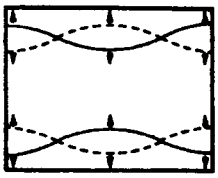
RV975 V-WAVE-A
(vertical upper and lower sine wave warp)



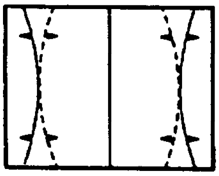
RV978 V-WAVE-U
(vertical upper sine wave warp)



RV980 V-M. PIN
(vertical middle pin warp)
※ Common in red, green, and blue



RV957 V/WING
(wing warp)
※ Common in red, green, and blue



RV956 H/M. PIN
(vertical middle pin warp)

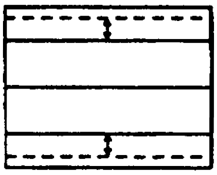
3-8. GREEN AND RED REGISTRATION ADJUSTMENTS

1. Input cross hatch signal.
2. Enter service mode. Select B OFF of SERVICE MODE to cut off blue output.
3. Turn the vertical red (V.R) and horizontal red (H.R) variable resistors (VRs) to adjust red picture convergence in relation to green picture according to the following steps:

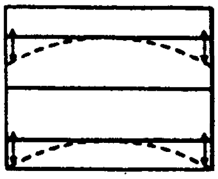
(Adjustment procedure)

1. [LIN (linearity)] → [SIZE (amplitude)] → [CENT (center position)] →
2. [BOW] → [SKEW] → [CENT (center position)]
3. [PIN (pin warp)] → [SUB BOW] → [BOW] [H/M. PIN (horizontal middle pin warp)]
4. [KEYS (trapezoid)] → [SUB SKEW] → [SKEW]
5. [M.WAVE (middle sine wave warp)] → [WAVE-A (upper and lower sine wave warp)] → [WAVE-U (upper sine wave warp)]
   ※ For vertical (V) only.

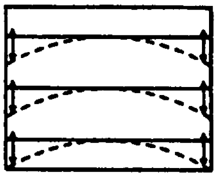
(Dot motion)



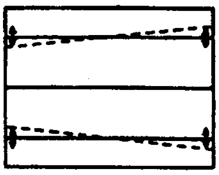
RV912 V.B SIZE
(vertical red amplitude)



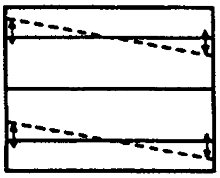
RV952 V.R SUB BOW
(vertical red sub bow)



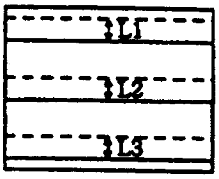
RV943 V.R BOW
(vertical red bow)



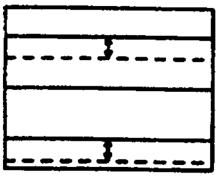
RV928 V.R KEYS
(vertical red trapezoid)



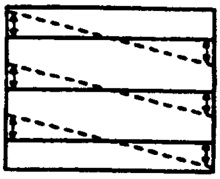
RV946 V.R SUB SKEW
(vertical red sub skew)



RV904 V.R CENT
(vertical red center position)



RV917 V.R LIN
(vertical red linearity)



RV922 V.R SKEW
(vertical red skew)

H.R LIN	···············	RV915
H.R SIZE	···············	RV907
H.R CENT	···············	RV901
H.R BOW	···············	RV931
H.R SKEW	···············	RV919
H.R PIN	···············	RV940
H.R KEYS	···············	RV926
H.R SUB BOW	···············	RV949
II.R SUB SKEW	···············	RV943
V-M-WAVE	···············	RV973
V-WAVE-A	···············	RV976
V-WAVE-U	···············	RV979
V-M.PIN	···············	RV980
V/WING	···············	RV957
H/M.PIN	···············	RV956

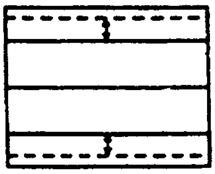
3-9. GREEN AND BLUE REGISTRATION ADJUSTMENTS

1. Input cross hatch signal.
2. Enter service mode. Select R OFF of SERVICE MODE to cut off red output.
3. Turn the vertical blue (V.B) and horizontal blue (H.B) variable resistors (VRs) to adjust blue picture convergence in relation to green picture according to the following steps:

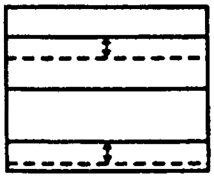
(Adjustment procedure)

1. [LIN (linearity)] → [SIZE (amplitude)] → [CENT (center position)] →
2. [BOW] → [SKEW] → [CENT (center position)]
3. [PIN (pin warp)] → [SUB BOW] → [BOW] [H/M. PIN (horizontal middle pin warp)]
4. [KEYS (trapezoid)] → [SUB SKEW] → [SKEW]
5. [M.WAVE (middle sine wave warp)] → [WAVE-A (upper and lower sine wave warp)] → [WAVE-U (upper sine wave warp)] →

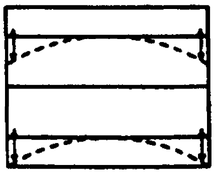
(Dot motion)



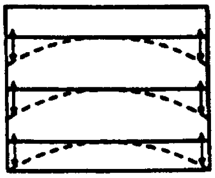
RV912 V.B SIZE
(vertical blue amplitude)



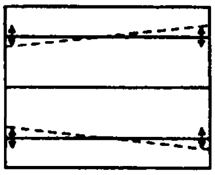
RV918 V.B LIN
(vertical blue linearity)

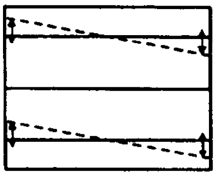


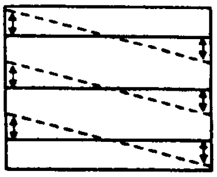
RV954 V.B SUB BOW
(horizontal blue sub bow)

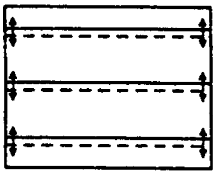


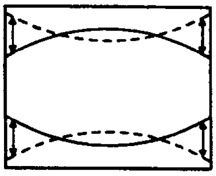
RV936 V.B BOW
(vertical blue bow)

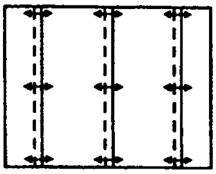

RV930 V.B KEYS
(vertical blue trapezoid)

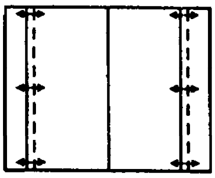

RV948 V.B SUB SKEW
(vertical blue sub skew)

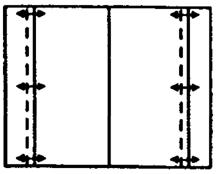

RV924 V.B SKEW
(vertical blue skew)

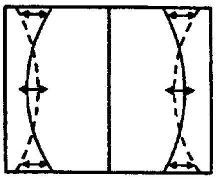

RV906 V.B CENT
(vertical blue center position)

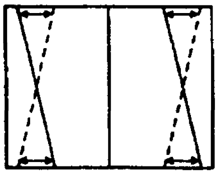

RV939 V.B PIN
(vertical blue pin warp)

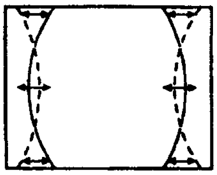

RV903 H.B CENT
(vertical blue center position)

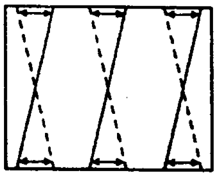

RV909 H.B SIZE
(horizontal blue amplitude)

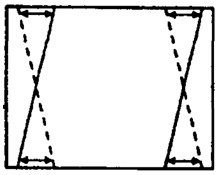

RV914 H.B LIN
(horizontal blue linearity)

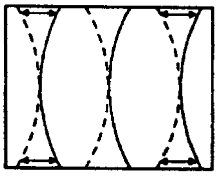

RV942 H.B PIN
(horizontal blue pin warp)

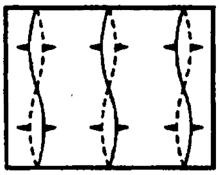

RV945 H.B SUB SKEW
(horizontal blue sub skew)

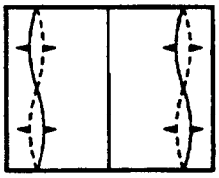

RV951 H.B SUB BOW
(horizontal blue sub bow)


RV921 H.B SKEW
(horizontal blue skew)


RV927 H.B KEYS
(horizontal blue trapezoid)


RV933 H.B BOW
(horizontal blue bow)


RV981
※ Common in red, green, and blue


RV982
※ Common in red, green, and blue

H/M PIN	RV958
M.WAVE	RV961
WAVE-A	RV974
WAVE-U	RV977

SECTION 4
CIRCUIT ADJUSTMENTS

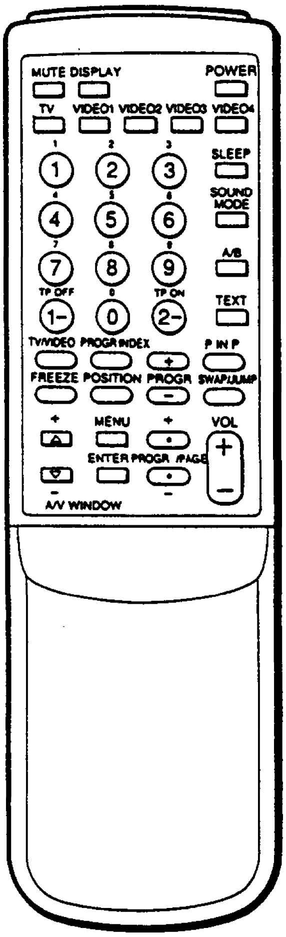
4-1. ADJUSTMENTS WITH COMMANDER

Service adjustments are made with the RM-821 that comes with this unit.

Entering service mode

With the unit on standby
⇩
"DISPLAY"
⇩
"5"
⇩
"VOL (+)"
⇩
"POWER"

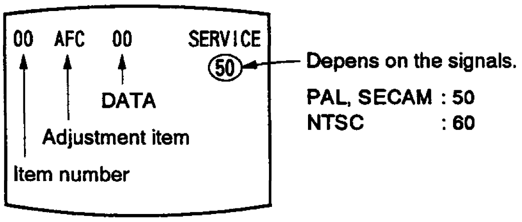
This operation sequence puts the unit into service mode.



"1", "4"	Raise/lower the service item number
"3", "6"	Raise/lower the data
"MUTE"	Writes
"0"	Executes the writing

"7", "0"	The data all becomes the values in memory
"8", "0"	User control all goes to the standard state
"9"	H-FRE automatic adjustment
"5", "0"	Service data initialization (Besure not to use usually.)
"2", "0"	Write 50 Hz adjustment data to 60 Hz, or in opposition.

The screen display is:



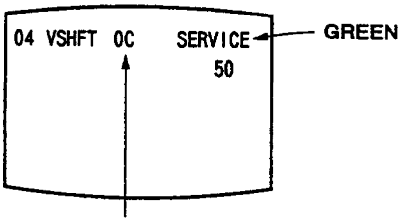
"1", "4" Select the adjustment item.
↓
"3", "6" Raise/lower the data.
↓
"MUTE" Writes.
↓
"0" Executes the writing.

4-2. ADJUSTMENT METHOD

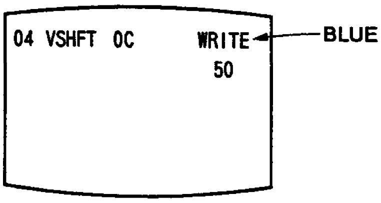
Item Number 04

This explanation uses VSHFT as an example.

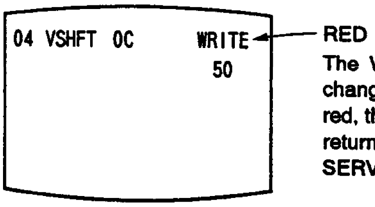
1. Select 04 VSHFT with the "1" and "4" buttons.
2. Raise/lower the data with the "3" and "6" buttons.
3. Select the optimum state. (The standard is for 0F PAL reception.)
4. Write with the MUTE button. (The display changes to blue WRITE.)
5. Execute the writing with the "0" button. (The WRITE display changes briefly to red.)



Adjusted with "3" and "6" buttons



Written with "MUTE"



The WRITE display changes briefly to red, then the display returns to a green SERVICE.

Write excuted with "0"

Use the same method for Items Number 00 – 50. Use "1" and "4" to select the adjustment item, use "3" and "6" to adjust, write with "MUTE", then execute the write with "0".

Note: In "WRITE", the data of all items are wrote together to memory.

- H-FRE can be adjusted automatically. Feed a standard signal and input "9", the automatic adjustment is executed.
- As for VFREQ, by searching the bolded screen V range with adjusting data.

Note: In item 02 50 Hz, or item 03 60 Hz, it operates normally in spite of the 50 Hz or the 60 Hz of the input signal. Therefore be suure to adjust data according to the input signal.

AN ITEM OF ADJUSTMENT

LABSEL	ITEM	DATA SPHERE	STANDARD *		NAME REGIST
			50 Hz	60 Hz	
0	AFC	00~03	00	00	AFC SW
1	HFRE	00~7 F	45	40	H FREQUENCY
2	VFR 5	00~1 F	0F		V FREQUENCY 50
3	VFR 6	00~1 F	0F		V FREQUENCY 60
4	VSFT	00~1 F	0C	0C	V SHIFT
5	VSIZ	00~3 F	26	27	V SIZE
6	VLIN	00~0 F	07	07	V LINEARITY
7	VSCO	00~0 F	07	07	V S CORRECT
8	HPHA	00~0 F	03	05	H SENT
17	VSM 5	00~01	00		V LOCK RANGE SW 50
18	VSM 6	00~01	00		V LOCK RANGE SW 60
28	SPIC	00~1 F	0 D		SUB PICTURE
29	SHUE	00~1 F	0 D		SUB HUE
30	SCOL	00~1 F	0 D		SUB COLOR
31	SBRT	00~1 F	0 D		SUB BRIGHTNESS
32	SSHP	00~1 F	0 D		SUB SHARPNESS
33	SBAL	00~1 F	0 D		SUB BALANCE
34	VM	00~02	00		VM ON/OFF/NR SYNC.
35	MDSH	00~3 F	35		MAIN SCREEN DISPLAY POSITION H DIRECTION
36	SDSH	00~3 F	0 E		PiP SCREEN DISPLAY POSITION H DIRECTION
37	PIPH	00~3 F	20	20	PinP H CENT POSITION
38	PIPV	00~0 F	08	08	PinP V CENT POSITION
39	PIPL	00~0 F	08		PinP OUT LEVEL
40	PIPC	00~07	04		PinP FRAME COLOR
41	PIPD	00~07	00	00	PinP DELAY
42	PIVS	00~07	04	04	PinP V CORRECT
43	PIHS	00~0 F	07	04	PinP H CORRECT
44	TXPC	00~0 F	05		TEXT PICTURE
45	BLUE	00~02	00		NO SIGNAL BLUE BACK Yes/No
46	OSD	00~01	00		SCREEN DISPLAY START POSITION
47	MDSV	00~1 F	0 F		MAIN SCREEN DISPLAY POSITION V DIRECTION
48	DEGA	00~01	※		DEGAUSS ON/OFF
49	ONDL	00~FF	80		POWER ON DELAY TIME
50	MUTE	00~01	01		NO SIGNAL SOUND MUTE Yes/No
51	GAMP	00~1 F	0 F		G DRIVE
52	BAMP	00~1 F	0 F		B DRIVE
53	GCUT	00~0 F	07		G CUT OFF
54	BCUT	00~0 F	07		B CUT OFF
55	SBR 2	00~1 F	0 D		SUB BRIGHTNESS
56	IK	00~03	01		IK REF PULSE
57	R-ON	00~01	01		R ON
58	G-ON	00~01	01		G ON
59	B-ON	00~01	01		B ON
60	ABLM	00~01	00		ABL MODE

* 50 : PAL input signal standard

* 60 : NTSC input signal standard

Notes :
08 H-PHA is adjusted with data 00-07.
34 VM does not function.
46 OSD is set to 0.
48 DEGA is set to 1.
49 OND is set to 80.
39 PIPL is set to 01 for M37204M8-A10SP (M M't IC 005)
08 for M37204M8-xxx
50 MUTE can not be selected for M37204M8-A10SP
32 SSHP is set to 03 for M37204M8-A10SP
0D for M37204M8-xxx

4-3. PICTURE QUALITY ADJUSTMENTS

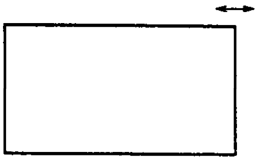
Item Numbers 28 − 33

SPIC SHUE SCOL SBRT	When it is out of order in the user 50% condition, be sure to adjust.
SSHP SBAL	Set to the standard values.

4-4. DISPLAY POSITION ADJUSTMENT

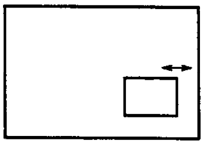
Item Numbers 35 − 43

35 MDSH Main screen display position, horizontal



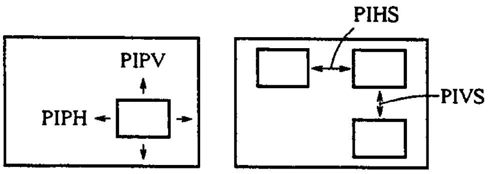
Stretches/contracts the right side of the screen.

36 SDSH PinP screen display position



Stretches/contracts the right side of the child screen.

37	PIPH	Pin-P horizontal position correction
38	PIPV	Pin-P vertical position correction
42	PIVS	Pin-P vertical correction
43	PIHS	Pin-P horizontal correction

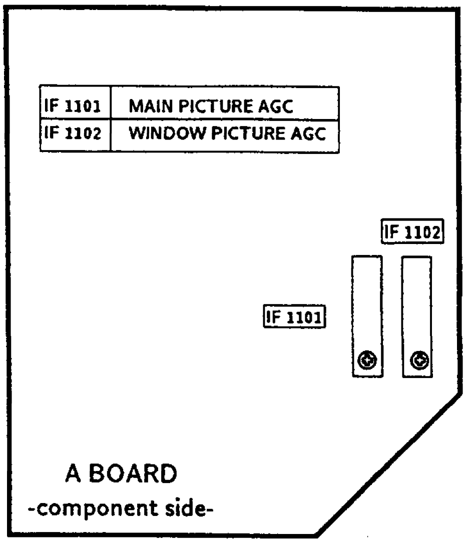


- When pressing PIP "POSITION" key in the servicce mode, "POSITION" turns round and round automatically.

Item Numbers 39 − 41 and 47 are set to the standard values.

44 TXPIC Text picture
Corrects the brightness for when teletext is received.
Standard value is 05.

4-5. A BOARD ADJUSTMENTS



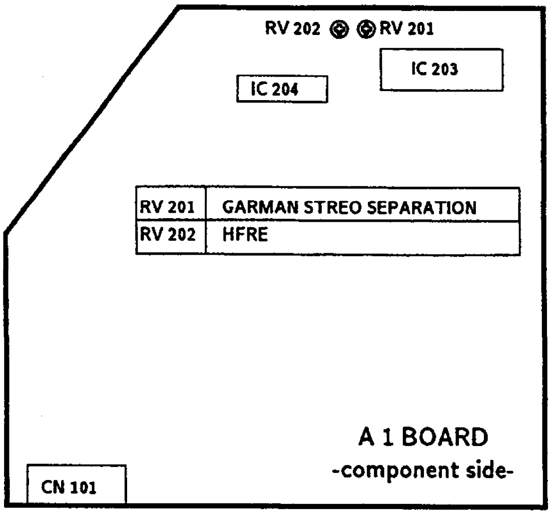
Main screen AGC adjustment (IF1101)

1. Receive an off-air signal.
2. Adjust the IF1101 RF AGC VR so that there is no snow noise or cross-modulation.
3. Switch the channel and verify the adjustment.

PinP screen AGC adjustment (IF1102)

1. Receive an off-air signal.
2. Adjust the IF1102 RF AGC VR so that there is no snow noise or cross-modulation.
3. Switch the channel and verify the adjustment.

4-6. A1 BOARD ADJUSTMENTS



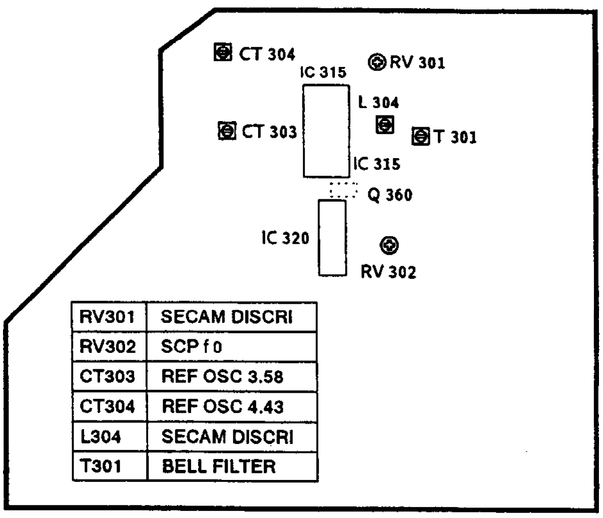
German stereo separation adjustment (RV201)

1. Input a 400 Hz signal to the left and a 1 kHz signal to the right.
2. Connect an oscilloscope to Pins ⑧ and ⑨ of CN101.
3. Adjust RV201 so that a 400Hz sine wave is output from Pin ⑧ and a 1 kHz sin wave is output from Pin ⑨.

Horizontal frequency adjustment (RV202)

1. Connect Pin ⑫ of IC204 to ground.
2. Receive a PAL color bar signal.
3. Connect a frequency counter to Pin ⑬ of IC203.
4. Adjust RV202 for a frequency of 15625 ± 50 Hz.
5. Remove the ground from Pin ⑫ of IC204.

4-7. B BOARD ADJUSTMENTS

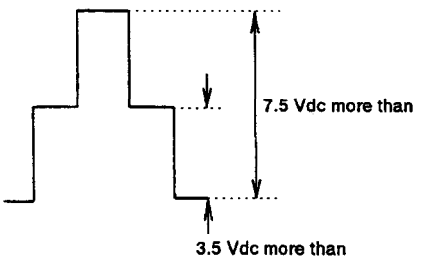


RV301	SECAM DISCRI
RV302	SCP f 0
CT303	REF OSC 3.58
CT304	REF OSC 4.43
L304	SECAM DISCRI
T301	BELL FILTER

B BOARD (MAIN PICTURE)
-component side-

SCP f0 adjustment (RV302)

1. Connect Pin ⑫ of IC320 to ground.
2. Connect a frequency counter to Pin ④ of IC320.
3. Adjust RV302 for a frequency of 15.625 kHz.
4. Check that the SCP pulse is output at Pin ⑥ of IC320.



5. Remove the ground from Pin ⑫ of IC320.

Reference oscillation adjustment (CT304)

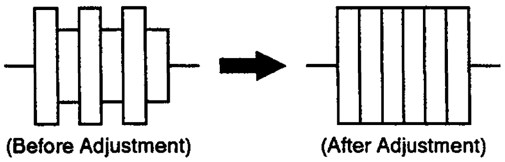
1. Connect Pin ⑰ of IC315 to ground.
2. Input a PAL color bar signal.
3. Adjust CT304 to the point where the screen moves the slowest.
4. Remove the ground from Pin ⑰ of IC315.

Reference oscillation adjustment (CT303)

1. Connect Pin ⑰ of IC315 to ground.
2. Input a 3.58 NTSC color bar signal.
3. Adjust CT303 to the point where the screen moves the slowest.
4. Remove the ground from Pin ⑰ of IC315.

Bell filter adjustment (T301)

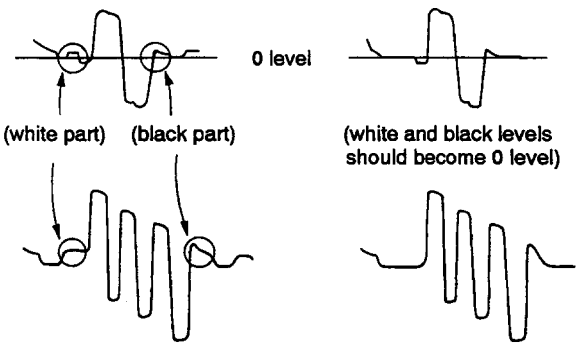
1. Input a SECAM color bar signal.
2. Connect an oscilloscope to the emitter of Q360.
3. Adjust T301 so that the waveform is flat.



(Before Adjustment) (After Adjustment)

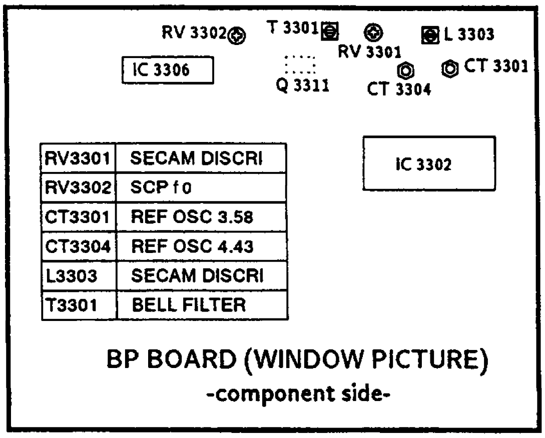
SECAM DISCRI adjustment (RV301, L304)

1. Input a SECAM color bar signal.
2. Connect an oscilloscope to Pin ① of IC315.
3. Adjust RV301 so that the sections corresponding to white and black are at 0 level.
4. Connect the oscilloscope to Pin ③ of IC315.
5. Adjust L304 so that the sections corresponding to white and black are at 0 level.
6. Carry out the 2 – 5 tracking.



(Before Adjustment) (After Adjustment)

4-8. BP BOARD ADJUSTMENTS (PinP screen)

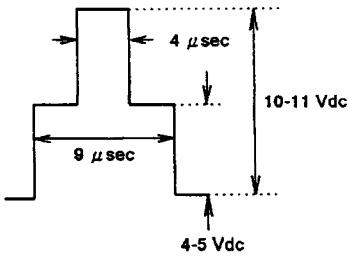


RV3301	SECAM DISCRI
RV3302	SCP f0
CT3301	REF OSC 3.58
CT3304	REF OSC 4.43
L3303	SECAM DISCRI
T3301	BELL FILTER

BP BOARD (WINDOW PICTURE)
-component side-

SCP fo adjustment (RV3302)

1. Connect Pin ⑫ of IC3306 to ground.
2. Connect a frequency counter to Pin ④ of IC3306.
3. Adjust RV3302 for 15.625 kHz.
4. Check that the SCP pulse is output at Pin ⑥ of IC3306.



5. Remove the ground from Pin ⑫ of IC3306.

Reference oscillation adjustment (CT3304)

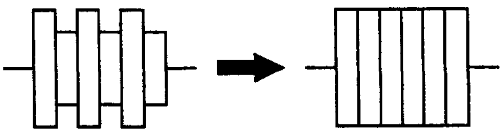
1. Connect Pin ⑰ of IC3302 to ground.
2. Input a PAL color bar signal to the PinP screen.
3. Adjust CT3304 to the point where the screen moves the slowest.
4. Remove the ground from Pin ⑰ of IC3302.

Reference oscillation adjustment (CT3301)

1. Connect Pin ⑰ of IC3302 to ground.
2. Input a 3.58 NTSC color bar signal.
3. Adjust CT3301 to the point where the screen moves the slowest.
4. Remove the ground from Pin ⑰ of IC3302.

Bell filter adjustment (T3301)

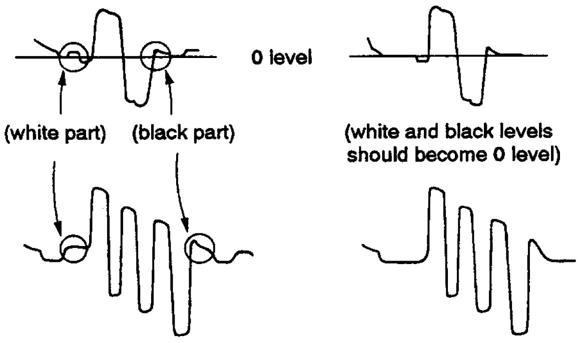
1. Input a SECAM color bar signal.
2. Connect an oscilloscope to the emitter of Q3311.
3. Adjust T3301 so that the waveform is flat.



(Before Adjustment) (After Adjustment)

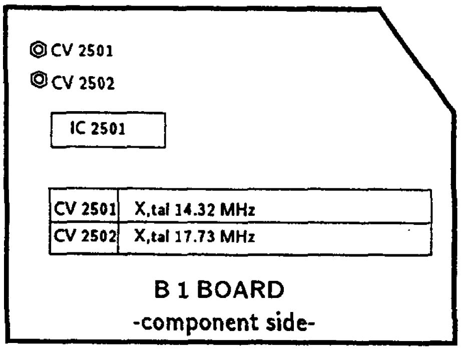
SECAM DISCRI adjustment (RV3301, L3303)

1. Input a SECAM color bar signal.
2. Connect an oscilloscope to Pin ① of IC3302.
3. Adjust RV3301 so that the sections corresponding to white and black are at 0 level.
4. Connect the oscilloscope to Pin ③ of IC3302.
5. Adjust L3303 so that the sections corresponding to white and black are at 0 level.
6. Carry out the 2 – 5 tracking.



(Before Adjustment) (After Adjustment)

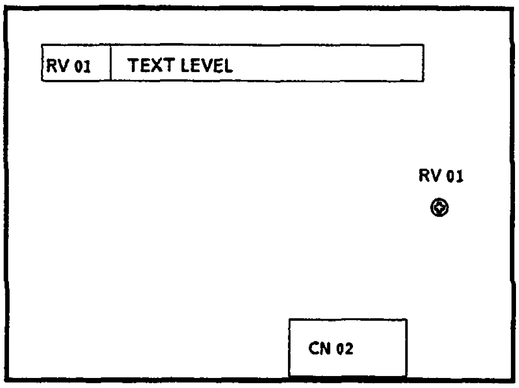
4-9. B1 BOARD ADJUSTMENT



Crystal adjustment (CV2502)

1. Put the unit into the no-signal state.
2. Select PAL with COLOR SYSTEM.
3. Connect a frequency counter to Pin ⑰ of IC2501.
4. Adjust CV2502 for a frequency of 17.73447 MHz ± 100 Hz.
5. Select NTSC with COLOR SYSTEM.
6. Adjust CV2501 for a frequency of 14.31818 MHz ± 100 Hz.

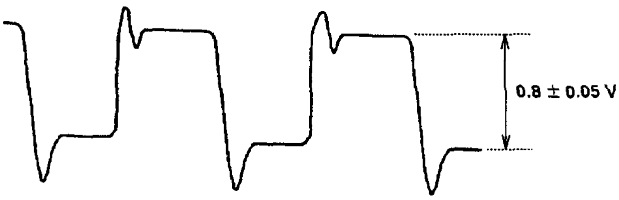
4-10. V BOARD ADJUSTMENT



V BOARD
-component side-

Text level adjustment (RV01)

1. Receive a teletext signal.
2. Connect an oscilloscope to Pin ④ of CN02.
3. Adjust RV01 for a voltage of 0.5 ± 0.05 V.

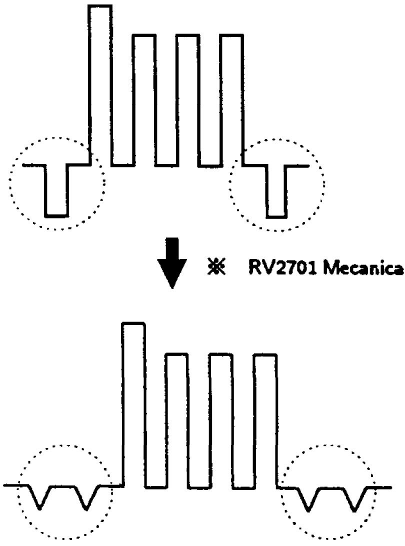


Note: The item 44 TXPIC should be set to 05 value in the service mode.

4-11. A0 BOARD ADJUSTMENT

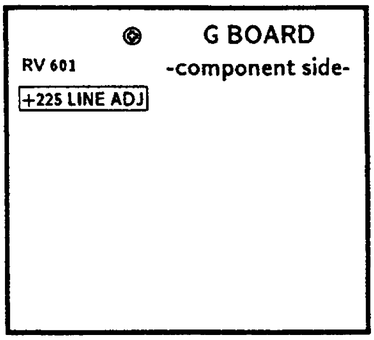
RGB pedestal adjustment (RV2704)

1. Input a PAL color-bar signal.
2. Connect an oscilloscope to B output of TP2701 A0 board.
3. Adjust RV2704 so that the waveform as shown.



4. Connect an oscilloscope to G output of TP2702 A0 board.
5. Adjust RV2702 so that the waveform as shown.
6. Connect an oscilloscope to R output of TP2703 A0 board.
5. Adjust RV2703 so that the waveform as shown.

4-12. G BOARD ADJUSTMENTS

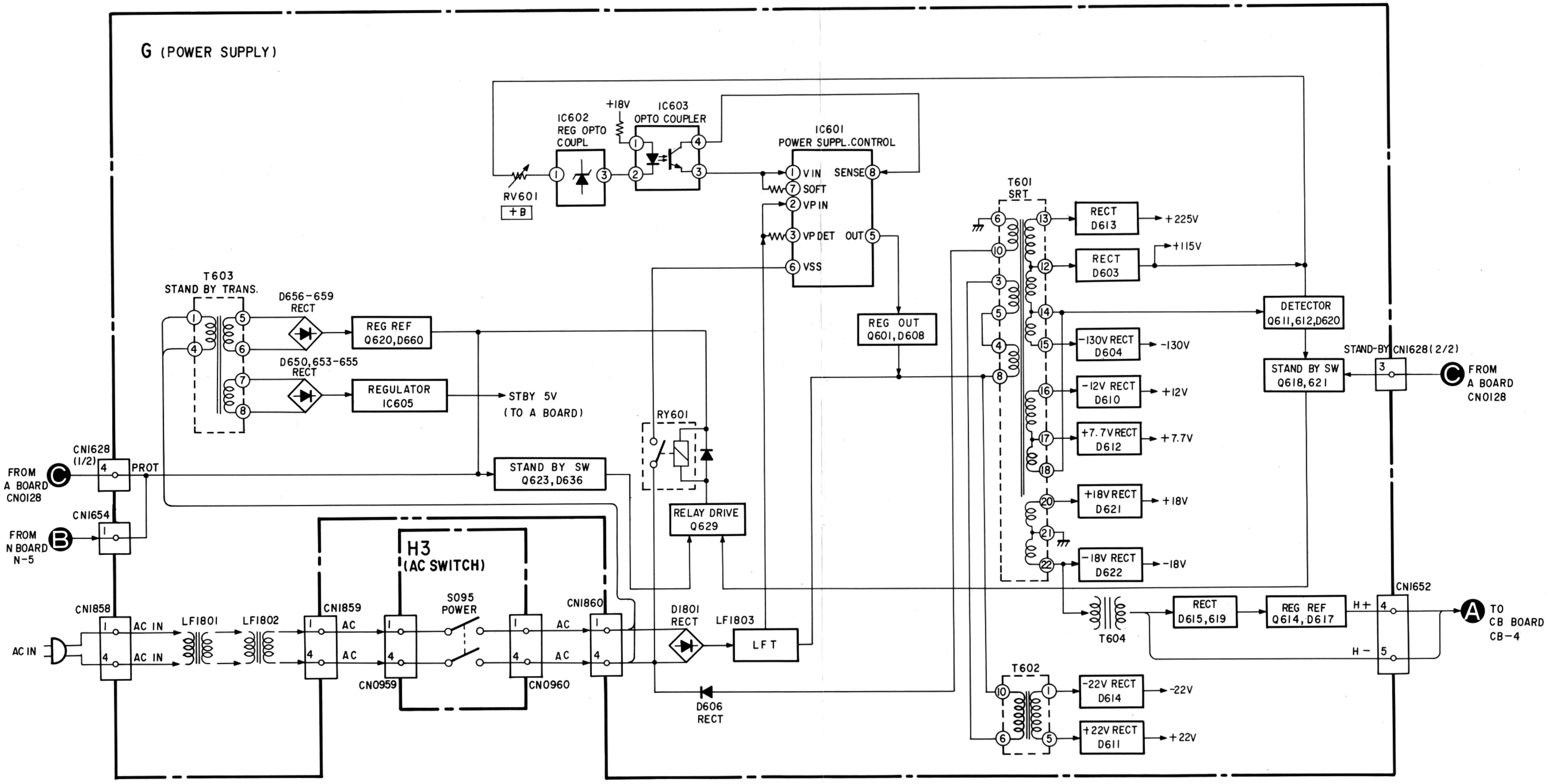


+225 V line adjustment (RV601)

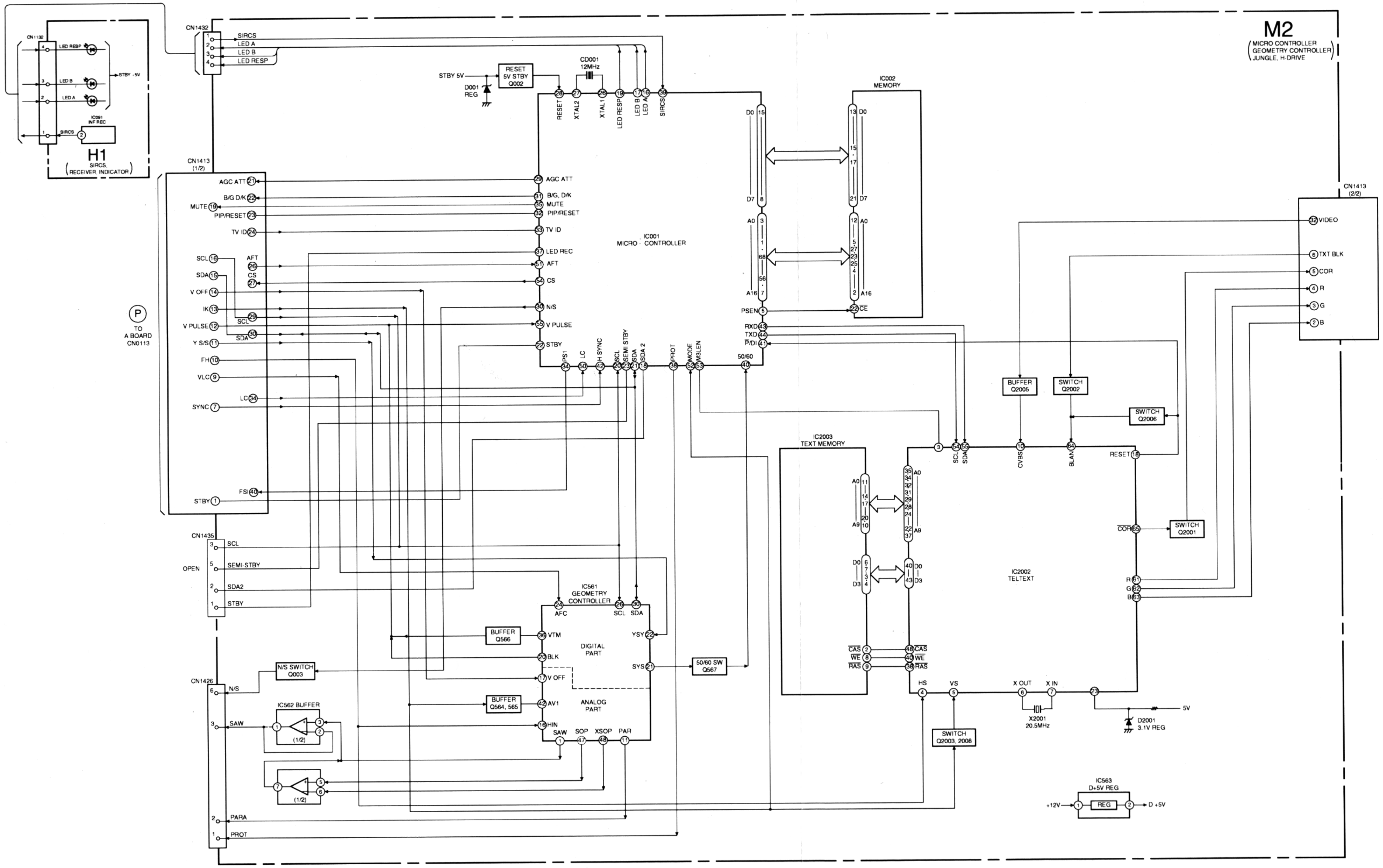
1. Input the color-bar signal.
2. Connect a digital multimeter to emitter of Q604.
3. Adjust RV601 so that voltage is +225 ± 0.5 V.

SECTION 5
DIAGRAMS

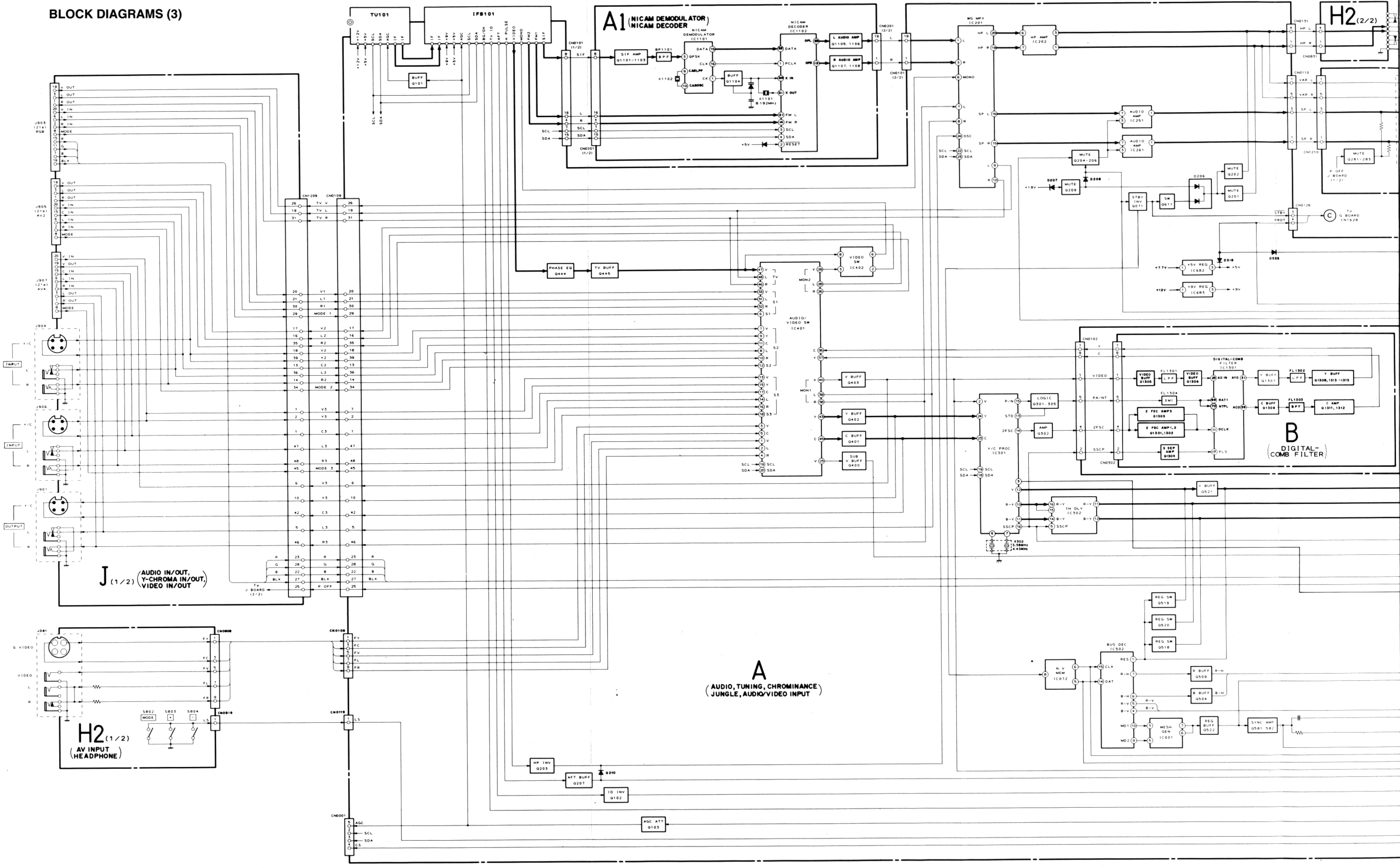
5-1. BLOCK DIAGRAMS (1)

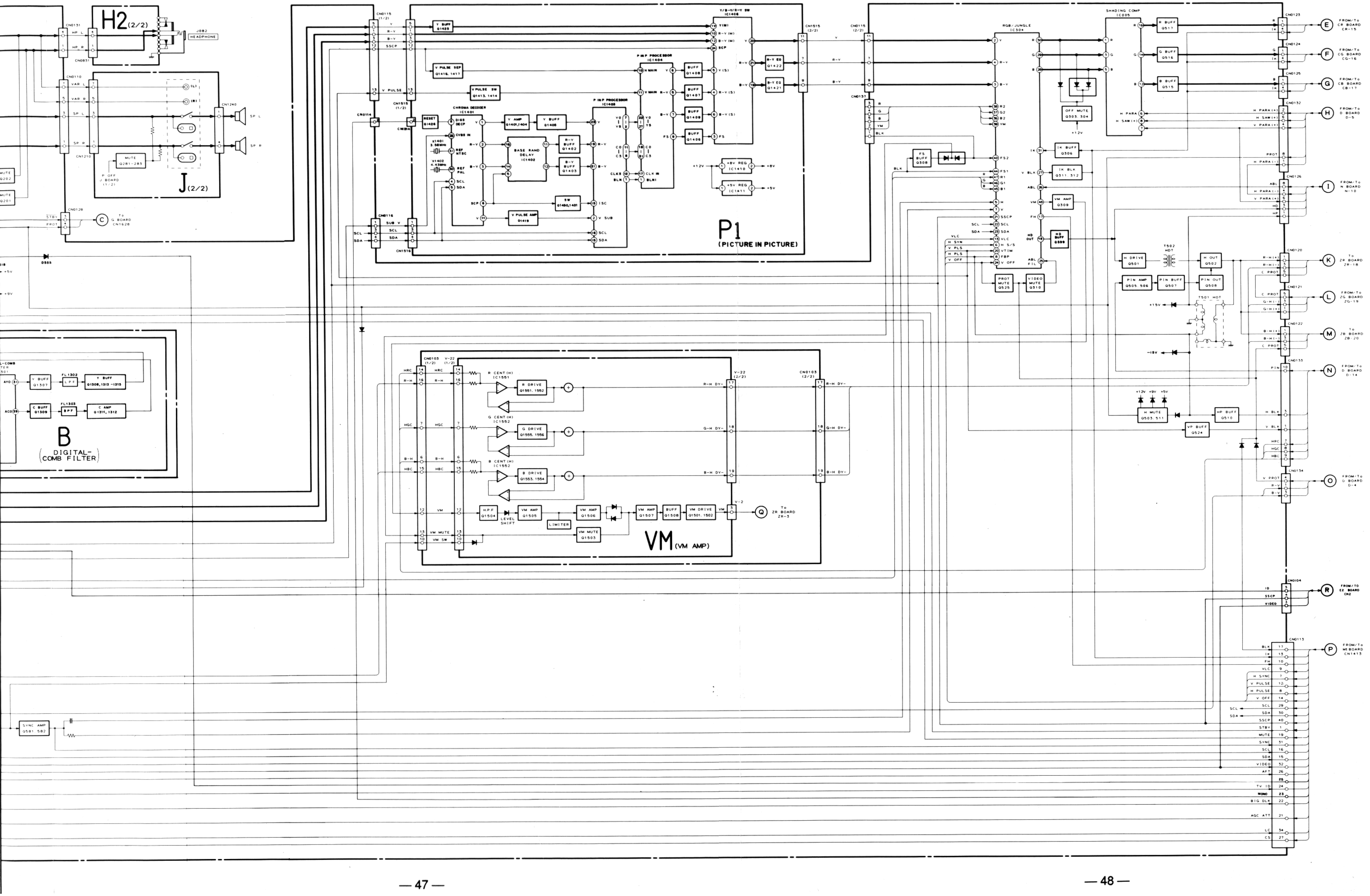


BLOCK DIAGRAMS (2)

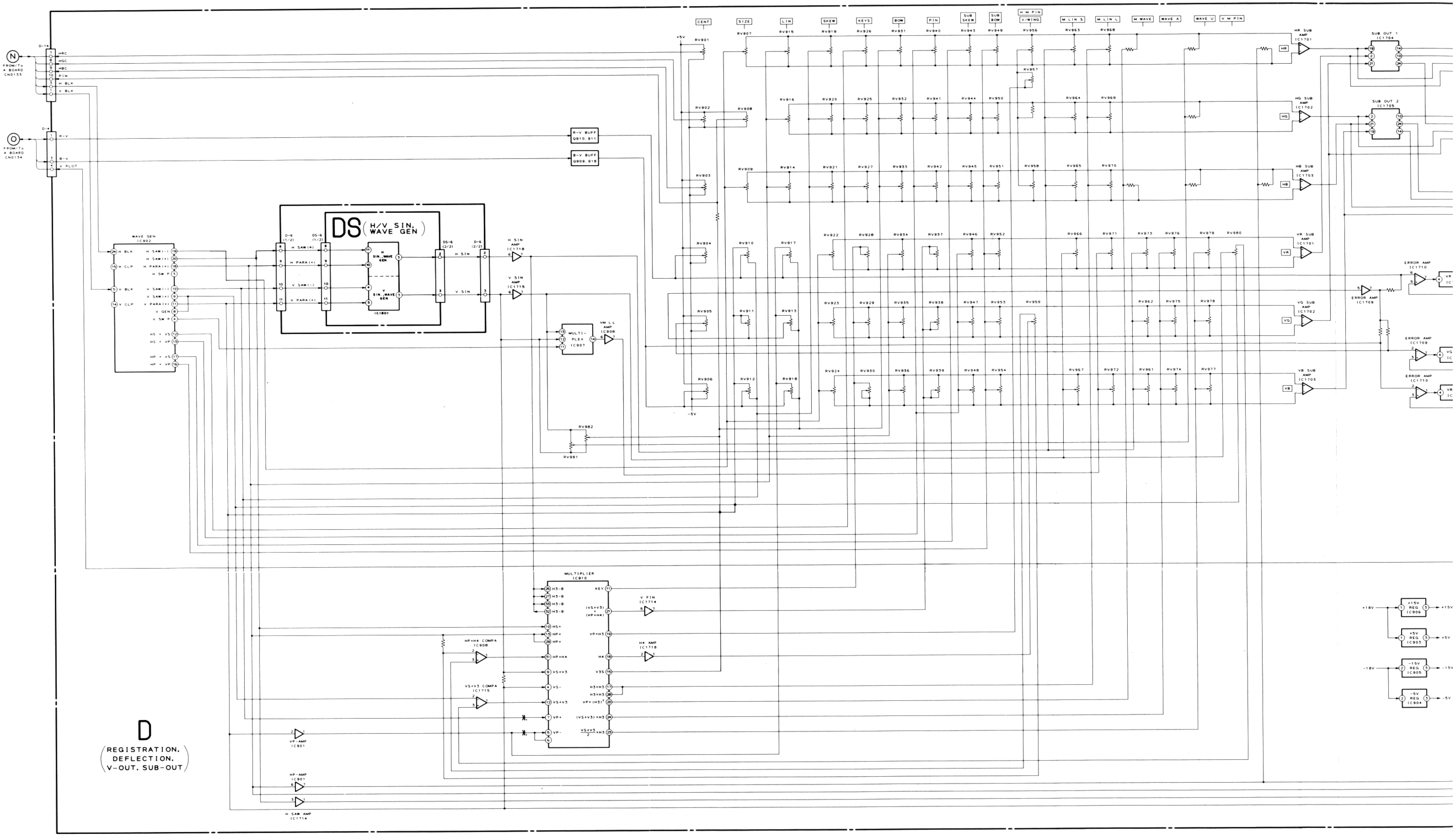


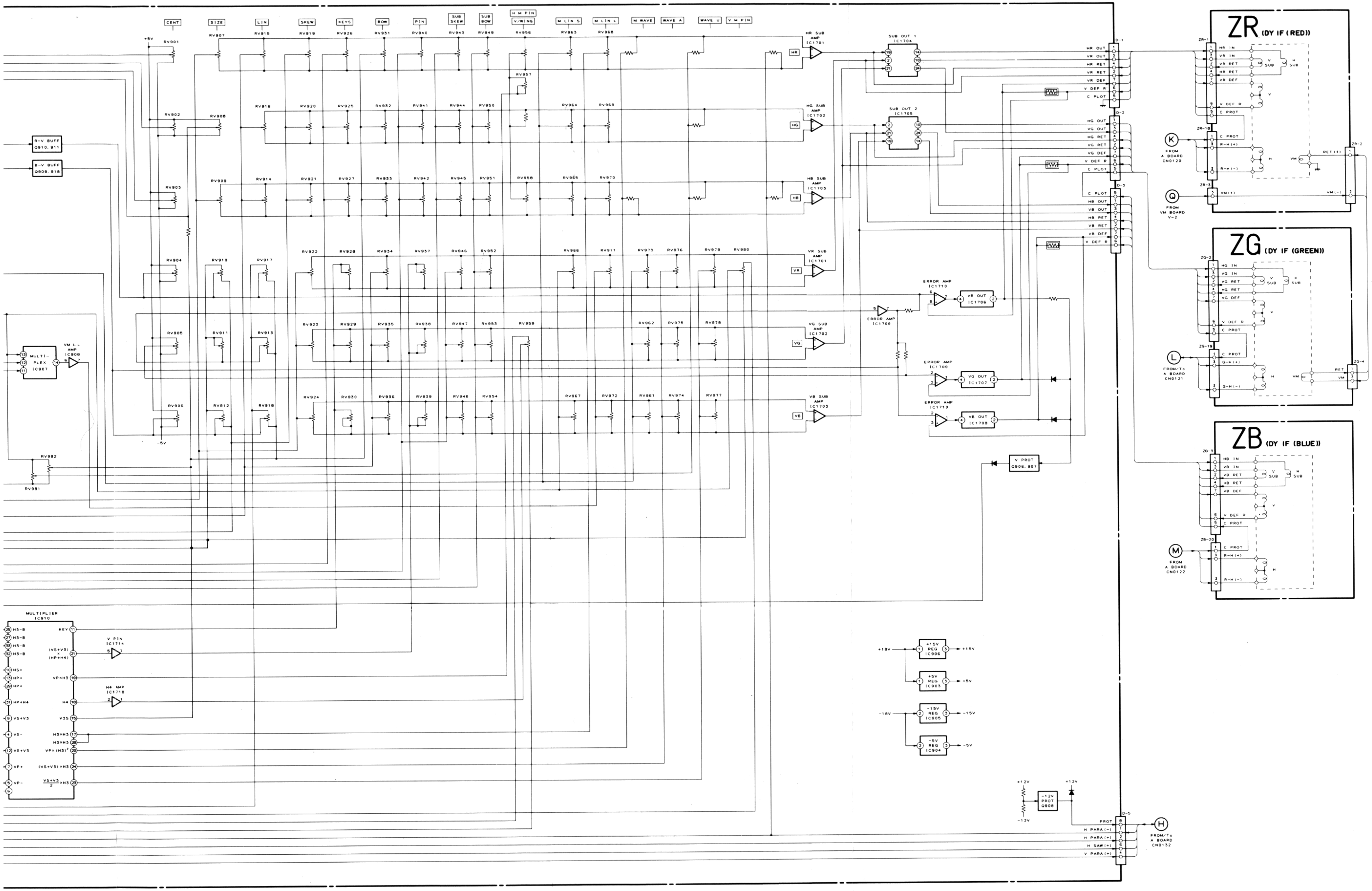
BLOCK DIAGRAMS (3)

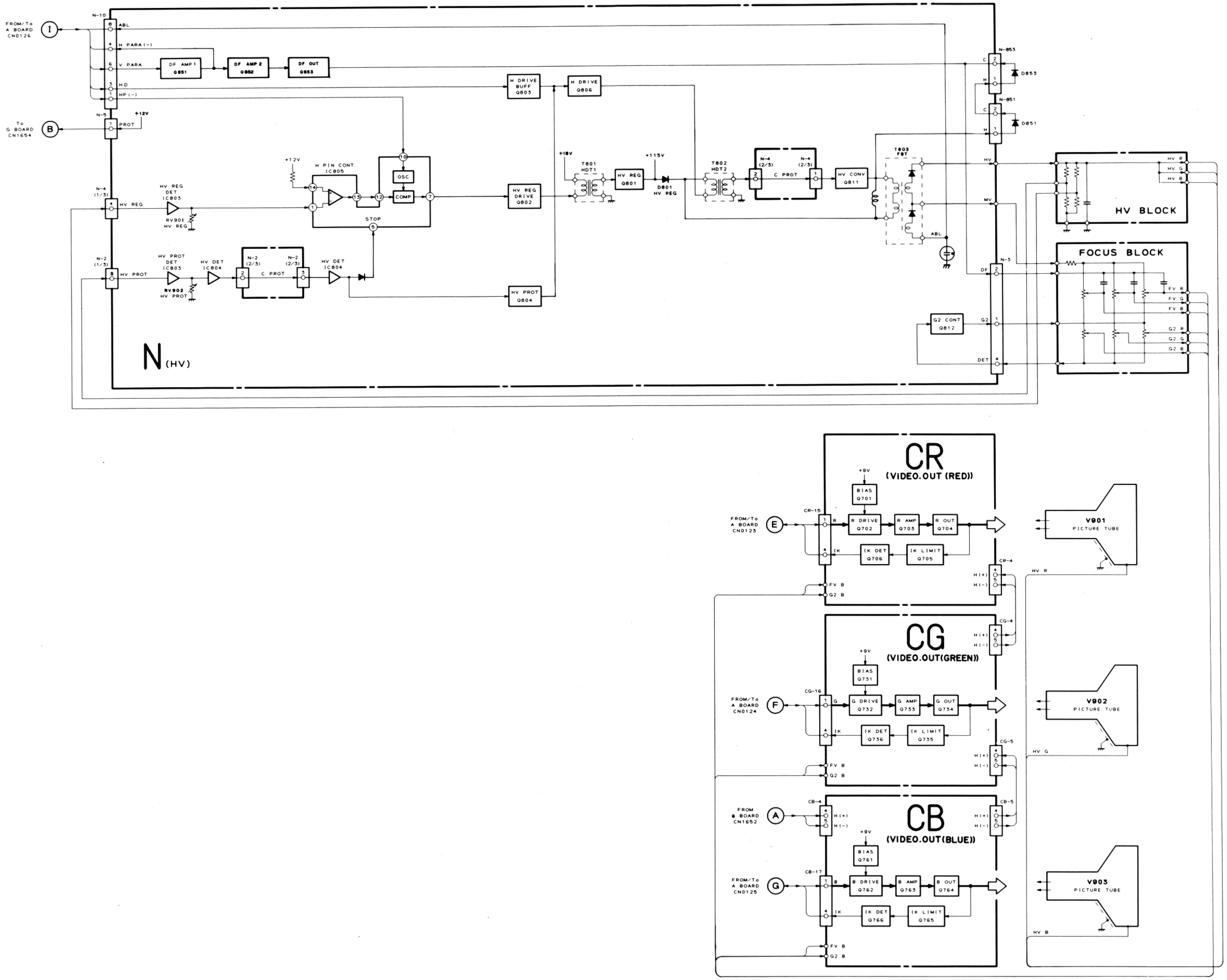



H2(2/2)
J882
HEADPHONE
CN0151
HP L
HP R
CN0831
CN0110
VAR L
VAR R
SP L
SP R
CN1240
CN1210
MUTE
Q281-283
P OFF
J BOARD
J(2/2)
CN0128
STBY
PROT
To
G BOARD
CN1628
D555
B
DIGITAL-
COMB FILTER
Y BUFF
Q1307
FL1302
LPF
Y BUFF
Q1308,1313-1315
C BUFF
Q1309
FL1303
BPF
C AMP
Q1311,1312
SYNC AMP
Q581,582
CN0115 (1/2)
CN1515 (1/2)
CN0114
CN0116
CN1516
Y BUFF
Q1425
V PULSE SEP
Q1416,1417
V PULSE SW
Q1413,1414
RESET
Q1426
CHROMA DECODER
IC1401
Y AMP
Q1401,1404
Y BUFF
Q1405
BASE BAND
DELAY
IC1402
R-Y BUFF
Q1402
B-Y BUFF
Q1403
SW
Q1430,1431
V PULSE AMP
Q1419
X1401
3.58MHz
X1402
4.43MHz
P INP PROCESSOR
IC1403
P INP PROCESSOR
IC1404
BUFF
Q1408
BUFF
Q1407
BUFF
Q1409
BUFF
Q1406
Y/B-Y/R-Y SW
IC1406
R-Y EQ
Q1422
B-Y EQ
Q1421
+8V REG
IC1410
+5V REG
IC1411
+12V
+8V
+5V
P1
(PICTURE IN PICTURE)
CN1515 (2/2)
CN0115 (2/1)
CN0137
RGB/JUNGLE
IC304
FS BUFF
Q308
IK BUFF
Q306
IK BLK
Q311,312
VM AMP
Q309
HD BUFF
Q599
PROT MUTE
Q525
VIDEO MUTE
Q310
OFF MUTE
Q303,304
SHADING COMP
IC005
R BUFF
Q517
G BUFF
Q516
B BUFF
Q515
CN0123
CN0124
CN0125
CN0132
CN0126
CN0120
CN0121
CN0122
CN0133
CN0134
CN0104
CN0113
FROM/To
CR BOARD
CR-15
FROM/To
CG BOARD
CG-16
FROM/To
CB BOARD
CB-17
FROM/To
D BOARD
D-5
FROM/To
N BOARD
N-10
To
ZR BOARD
ZR-18
FROM/To
ZG BOARD
ZG-19
To
ZB BOARD
ZB-20
FROM/To
D BOARD
D-14
FROM/To
D BOARD
D-4
FROM/To
E2 BOARD
CN2
FROM/To
M1 BOARD
CN1413
H DRIVE
Q501
T502
HOT
H OUT
Q502
PIN AMP
Q505,506
PIN BUFF
Q507
PIN OUT
Q508
T501 HOT
+15V
-15V
H MUTE
Q503,511
HP BUFF
Q510
VP BUFF
Q524
CN0103 (1/2)
V-22 (1/2)
R CENT (H)
IC1551
R DRIVE
Q1551,1552
G CENT (H)
IC1552
G DRIVE
Q1555,1556
B CENT (H)
IC1552
B DRIVE
Q1553,1554
V-22 (2/2)
CN0103 (2/2)
R-H DY-
G-H DY-
B-H DY-
HPF
Q1504
LEVEL SHIFT
VM AMP
Q1505
LIMITER
VM AMP
Q1506
VM MUTE
Q1503
VM AMP
Q1507
BUFF
Q1508
VM DRIVE
Q1501,1502
To
ZR BOARD
ZR-3
VM(VM AMP)
BLK
IK
FH
VLC
H SYNC
V PULSE
H PULSE
V OFF
SCL
SDA
SSCP
STBY
MUTE
SYNC
VIDEO
AFT
TV ID
MONO
BIG BLK
AGC ATT
LC
CS

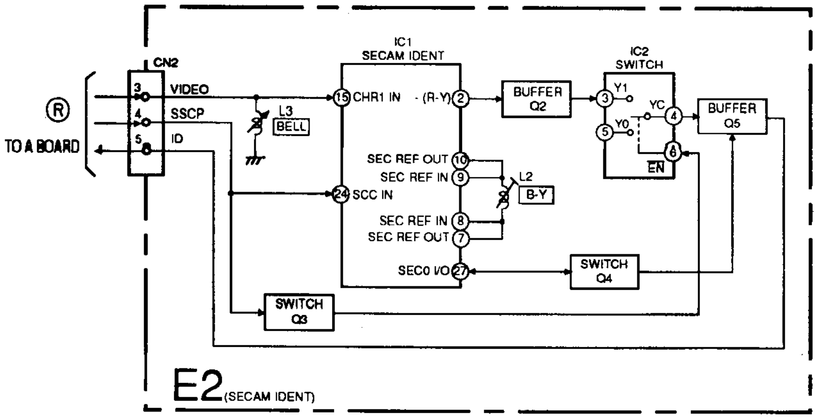
BLOCK DIAGRAMS (4)



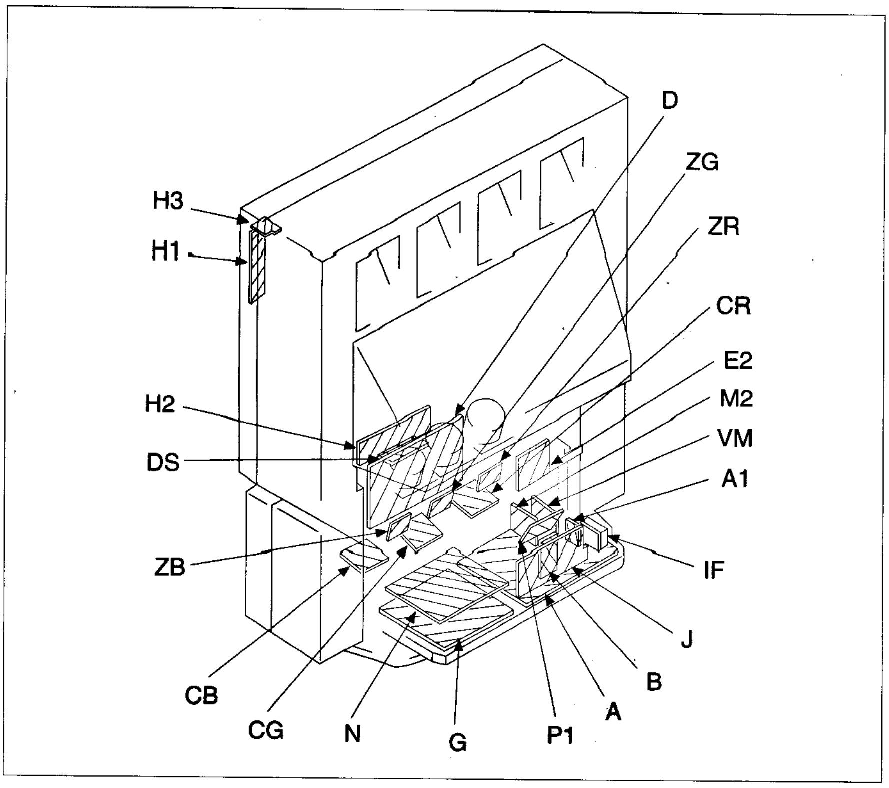

CENT
SIZE
LIN
SKEW
KEYS
BOW
PIN
SUB SKEW
SUB BOW
H M PIN V/WING
M LIN S
M LIN L
M WAVE
WAVE A
WAVE U
V M PIN
+5V
-5V
RV901
RV902
RV903
RV904
RV905
RV906
RV907
RV908
RV909
RV910
RV911
RV912
RV913
RV914
RV915
RV916
RV917
RV918
RV919
RV920
RV921
RV922
RV923
RV924
RV925
RV926
RV927
RV928
RV929
RV930
RV931
RV932
RV933
RV934
RV935
RV936
RV937
RV938
RV939
RV940
RV941
RV942
RV943
RV944
RV945
RV946
RV947
RV948
RV949
RV950
RV951
RV952
RV953
RV954
RV956
RV957
RV958
RV959
RV961
RV962
RV963
RV964
RV965
RV966
RV967
RV968
RV969
RV970
RV971
RV972
RV973
RV974
RV975
RV976
RV977
RV978
RV979
RV980
RV981
RV982
R-V BUFF Q910, 911
B-V BUFF Q909, 918
MULTI-PLEX IC907
VM LL AMP IC908
HR SUB AMP IC1701
HG SUB AMP IC1702
HB SUB AMP IC1703
VR SUB AMP IC1701
VG SUB AMP IC1702
VB SUB AMP IC1703
HR
HG
HB
VR
VG
VB
SUB OUT 1 IC1704
SUB OUT 2 IC1705
ERROR AMP IC1710
ERROR AMP IC1709
ERROR AMP IC1708
VR OUT IC1706
VG OUT IC1707
VB OUT IC1708
V PROT Q906, 907
MULTIPLIER IC910
H5-B
H3-B
H5+
HP+
HP+H4
VS+V3
VS-
VS+V3
VP+
VP-
KEY
(VS+V3) + (HP+H4)
VP×H3
H4
V3S
H3×H3
VP×(H3)
(VS+V3)×H3
(VS+V3)/2 ×H3
V PIN IC1714
H4 AMP IC1715
+18V
-18V
+15V REG IC906
+15V
+5V REG IC903
+5V
-15V REG IC905
-15V
-5V REG IC904
-5V
+12V
-12V
-12V PROT Q908
D-1
D-2
D-3
D-5
HR OUT
VR OUT
HR RET
VR RET
VR DEF
V DEF R
C PLOT
HG OUT
VG OUT
HG RET
VG RET
VG DEF
C PLOT
HB OUT
VB OUT
HB RET
VB RET
VB DEF
V DEF R
PROT
H PARA(-)
H PARA(+)
H SAW(+)
V PARA(+)
H
FROM/To A BOARD CN0132
ZR (DY IF (RED))
ZR-1
ZR-18
ZR-3
ZR-2
HR IN
VR IN
VR RET
HR RET
VR DEF
V DEF R
C PROT
R-H(+)
R-H(-)
VM(+)
VM(-)
RET(+)
V SUB
H SUB
V
H
VM
K
FROM A BOARD CN0120
Q
FROM VM BOARD V-2
ZG (DY IF (GREEN))
ZG-2
ZG-19
ZG-4
HG IN
VG IN
VG RET
HG RET
VG DEF
V DEF R
C PROT
G-H(+)
G-H(-)
RET
VM
L
FROM/To A BOARD CN0121
ZB (DY IF (BLUE))
ZB-3
ZB-20
HB IN
VB IN
VB RET
HB RET
VB DEF
V DEF R
C PROT
R-H(+)
R-H(-)
M
FROM A BOARD CN0122


FROM/To A BOARD CN0126
I
N-10
ABL
H PARA (-)
V PARA
H.D
HP (-)
DF AMP 1 Q851
DF AMP 2 Q852
DF OUT Q853
To G BOARD CN1654
B
N-5
PROT
+12V
N-4 (1/3)
HV REG
HV REG DET IC803
RV901 HV REG
+12V
H PIN CONT IC805
OSC
COMP
STOP
N-2 (1/3)
HV PROT
HV PROT DET IC803
RV902 HV PROT
HV DET IC804
N-2 (2/3)
C PROT
HV DET IC804
H DRIVE BUFF Q803
H DRIVE Q806
HV REG DRIVE Q802
HV PROT Q804
+18V
T801 HDT1
HV REG Q801
+115V
D801 HV REG
T802 HDT2
N-4 (2/3)
C PROT
HV CONV Q811
T803 FBT
ABL
N-853
D853
N-851
D851
HV
MV
N-3
DF
G2
DET
G2 CONT Q812
N (HV)
HV BLOCK
HV R
HV G
HV B
FOCUS BLOCK
FV R
FV G
FV B
G2 R
G2 G
G2 B
CR
(VIDEO.OUT (RED))
+9V
BIAS Q701
FROM/To A BOARD CN0123
E
CR-15
R
R DRIVE Q702
R AMP Q703
R OUT Q704
IK
IK DET Q706
IK LIMIT Q705
CR-4
H (+)
H (-)
FV B
G2 B
V901 PICTURE TUBE
HV R
CG
(VIDEO.OUT(GREEN))
CG-4
+9V
BIAS Q731
FROM/To A BOARD CN0124
F
CG-16
G
G DRIVE Q732
G AMP Q733
G OUT Q734
IK
IK DET Q736
IK LIMIT Q735
CG-5
H (+)
H (-)
FV B
G2 B
V902 PICTURE TUBE
HV G
CB
(VIDEO.OUT(BLUE))
FROM B BOARD CN1652
A
CB-4
H (+)
H (-)
CB-5
+9V
BIAS Q761
FROM/To A BOARD CN0125
G
CB-17
B
B DRIVE Q762
B AMP Q763
B OUT Q764
IK
IK DET Q766
IK LIMIT Q765
FV B
G2 B
V903 PICTURE TUBE
HV B

BLOCK DIAGRAMS (6)



5-2. CIRCUIT BOARD LOCATION



5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.
  k = 1000 , M = 1000K
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5 mm
Rating electrical power ¼ W

- ⊣▭⊢ : nonflammable resistor.
- △ : internal component.
- ▭ : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊥ : earth - ground.
- ⫽ : earth - chassis.
- # : no mounted.

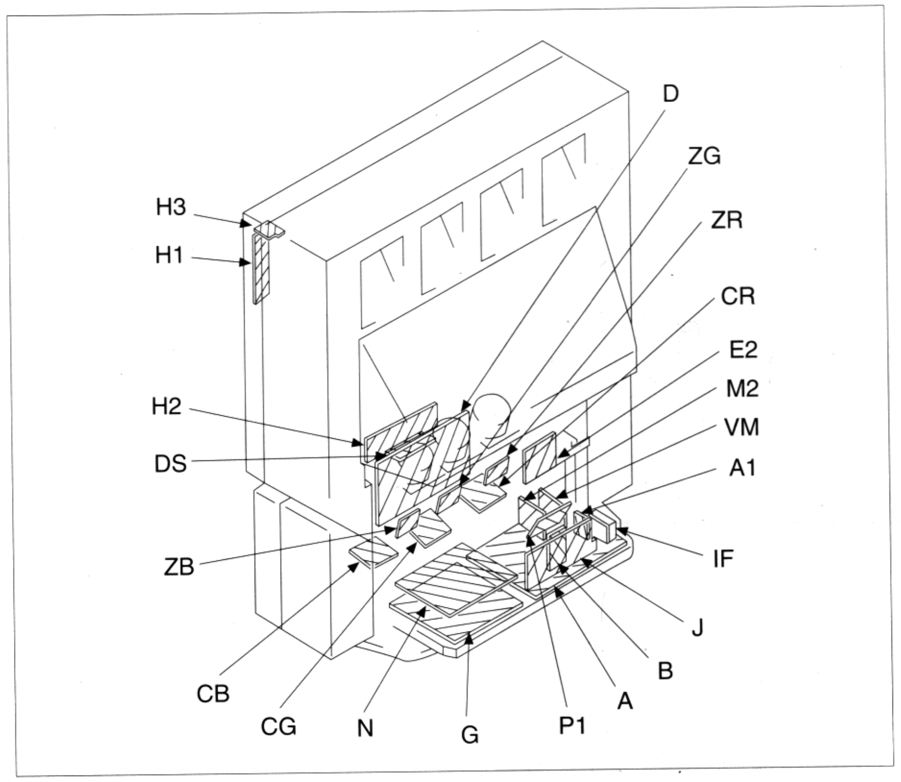
Note : The components identified by shading and marked ! are critical for safety. Replace only with part number specified.

Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ⨳	ADJUSTABLE RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

- Readings are taken with a colour-bar signal input.
- Readings are taken with 10M digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
- ▬ : B+ bus.
- ➡ : signal path. (RF)

5-2. CIRCUIT BOARD LOCATION



5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.
  k = 1000 , M = 1000K
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5 mm
Rating electrical power ¼ W

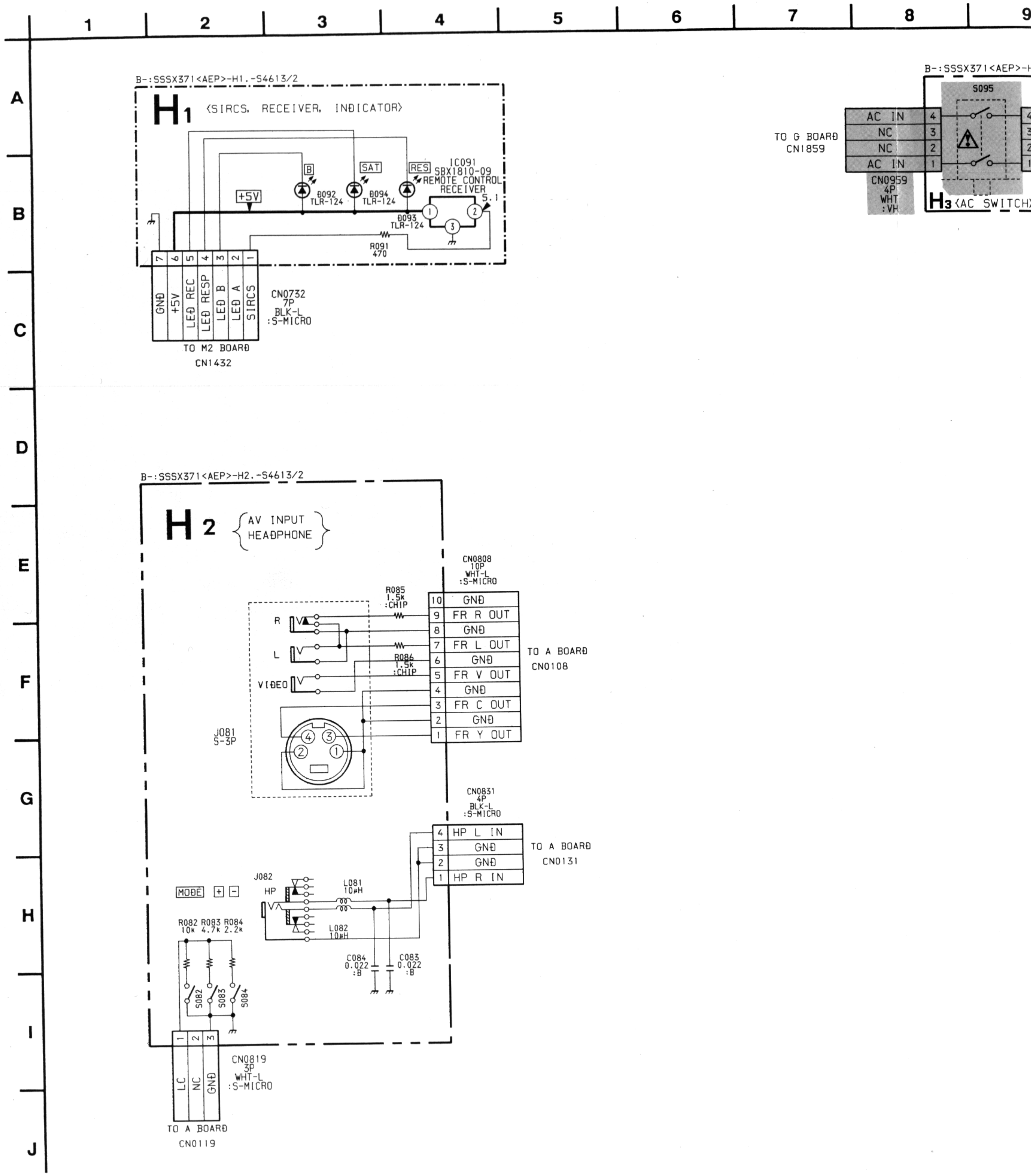
- -WW- : nonflammable resistor.
- △ : internal component.
- ▭ : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊥ : earth - ground.
- ⏚ : earth - chassis.
- ♯ : no mounted.

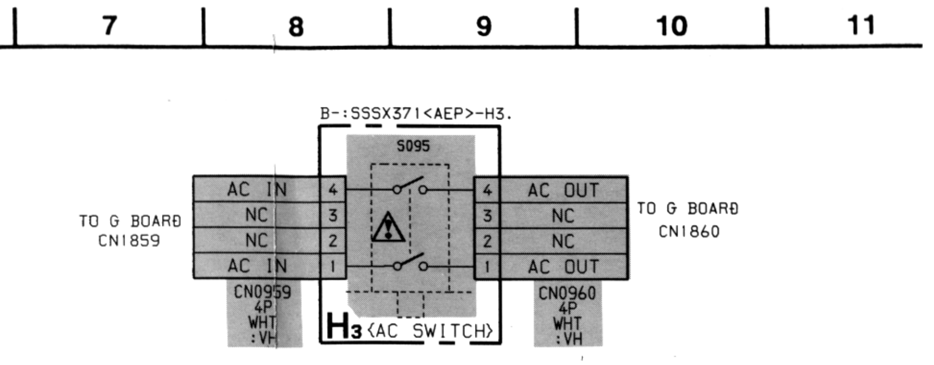
Note : The components identified by shading and marked ⚠ are critical for safety. Replace only with part number specified.

Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ✕	ADJUSTABLE RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

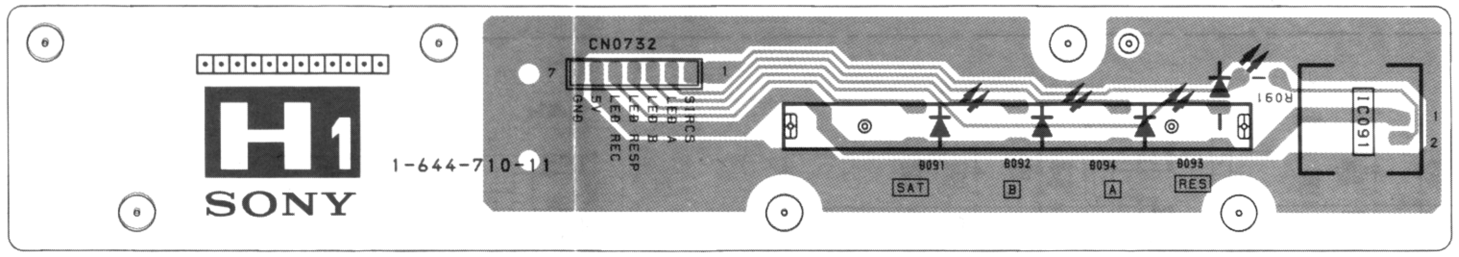
- Readings are taken with a colour-bar signal input.
- Readings are taken with 10M digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
- ▬ : B+ bus.
- ⇨ : signal path. (RF)



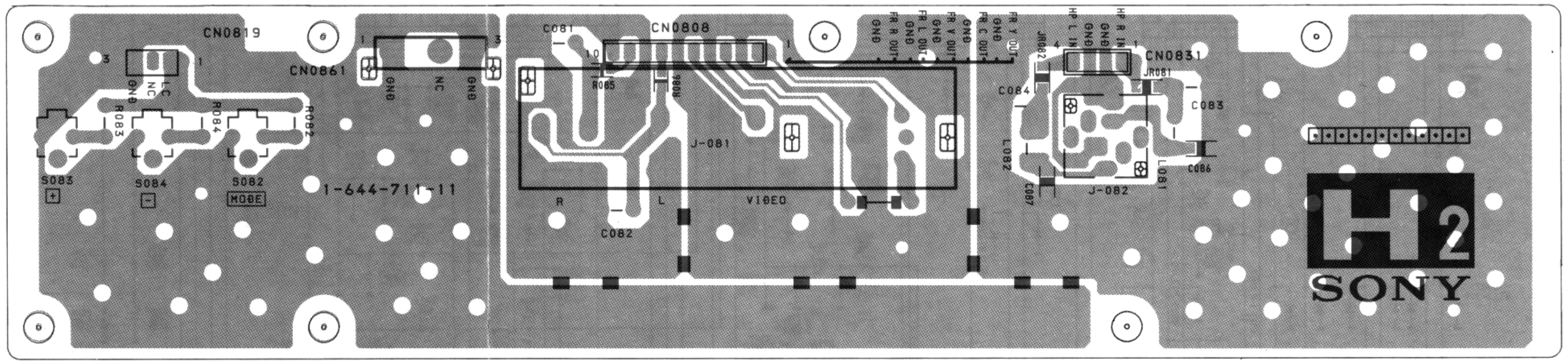


H1 [SIRCS, RECEIVER, INDICATOR] **H2** [AV INPUT HEADPHONE] **H3** [AC SWITCH]

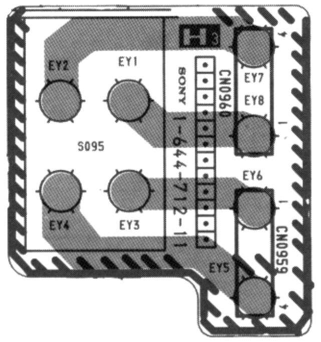
— H1 BOARD —

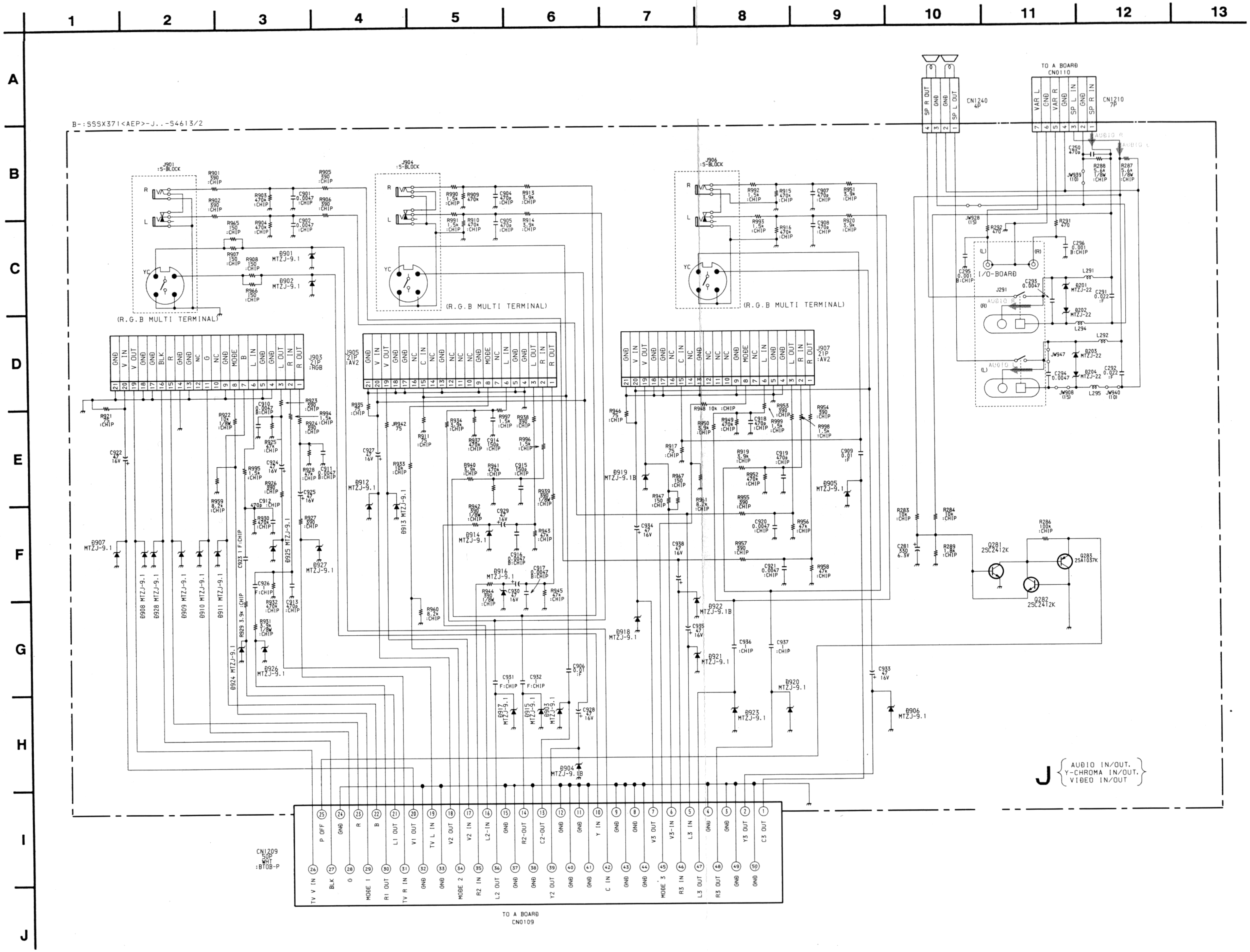


— H2 BOARD —



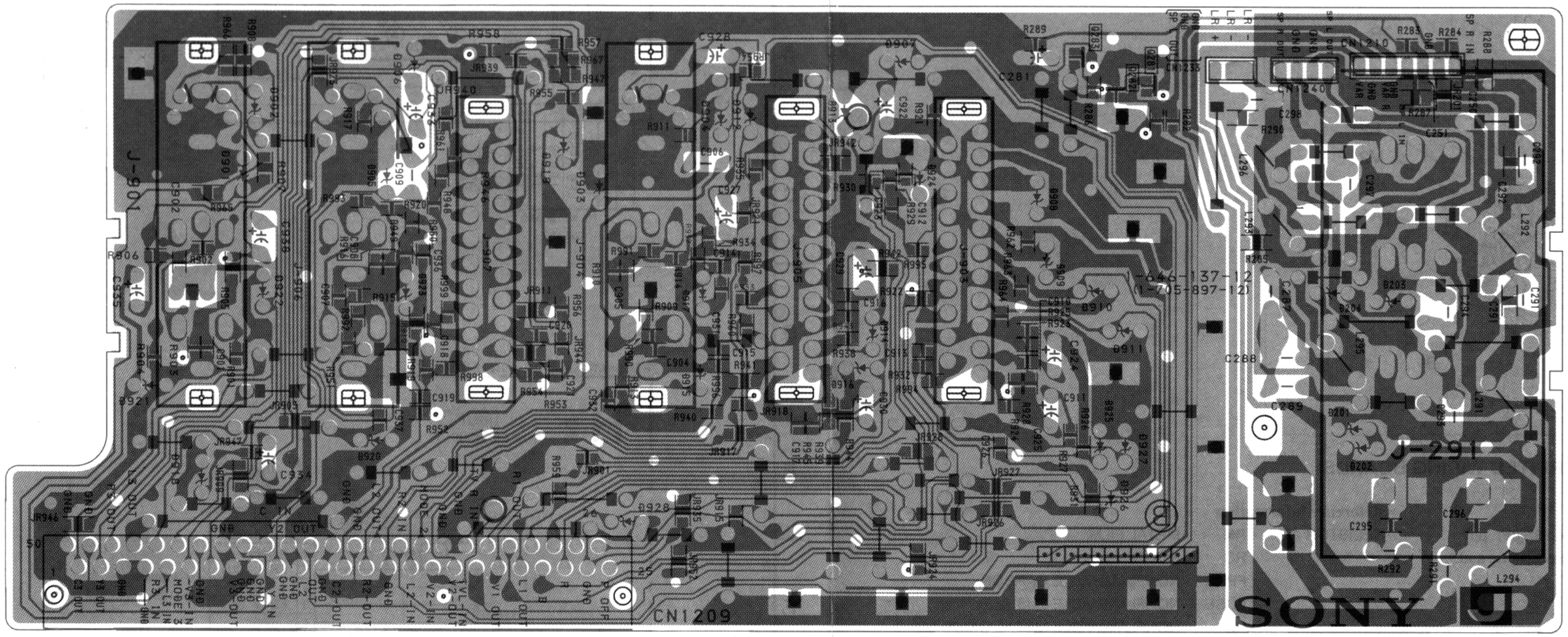
— H3 BOARD —



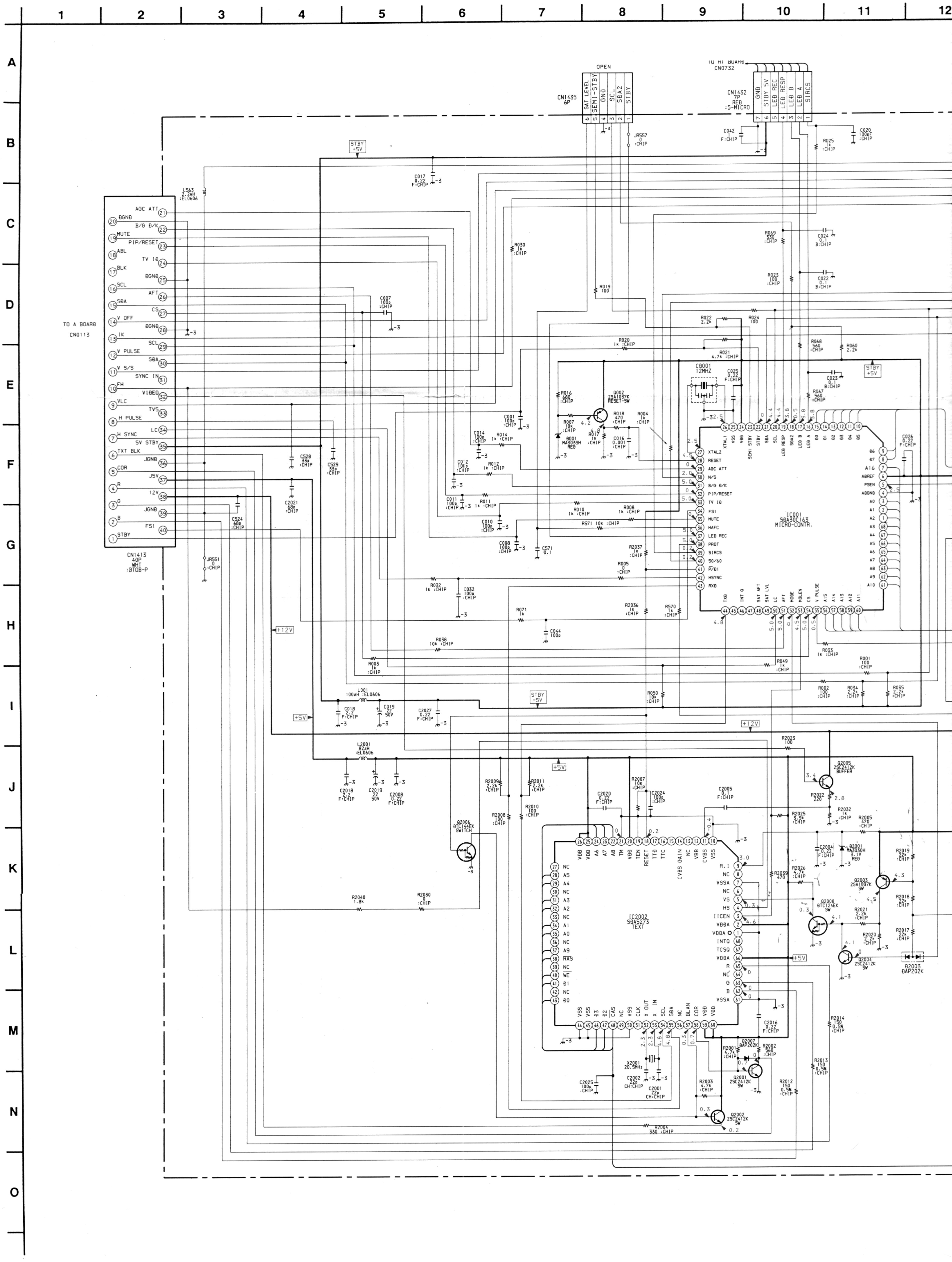

1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I J
B-:SSSX371<AEP>-J..-S4613/2
J901 :S-BLOCK
J904 :S-BLOCK
J906 :S-BLOCK
(R.G.B MULTI TERMINAL)
J903 21P :RGB
J905 21P :AV2
J907 21P :AV2
GND V IN V OUT GND BLK R GND GND NC G NC GND B L IN GND GND R IN R OUT
CN1240 4P
SP R OUT GND GND SP L OUT
TO A BOARD CN0110
CN1210 7P
VAR L GND VAR R GND SP L IN GND SP R IN
AUDIO R
AUDIO L
I/O-BOARD
J291
Q281 2SC2412K
Q282 2SC2412K
Q283 2SA1037K
CN1209 50P WHT :BTOB-P
P OFF GND R B L1 OUT V1 OUT TV L IN V2 OUT V2 IN L2-IN GND R2-OUT C2-OUT GND GND Y IN GND GND V3 OUT V3-IN L3 IN GND GND Y3 OUT C3 OUT
TV V IN BLK G MODE 1 R1 OUT TV R IN GND GND MODE 2 R2 IN L2 OUT GND GND Y2 OUT GND GND C IN GND GND MODE 3 R3 IN L3 OUT R3 OUT GND GND
TO A BOARD CN0109
J AUDIO IN/OUT, Y-CHROMA IN/OUT, VIDEO IN/OUT

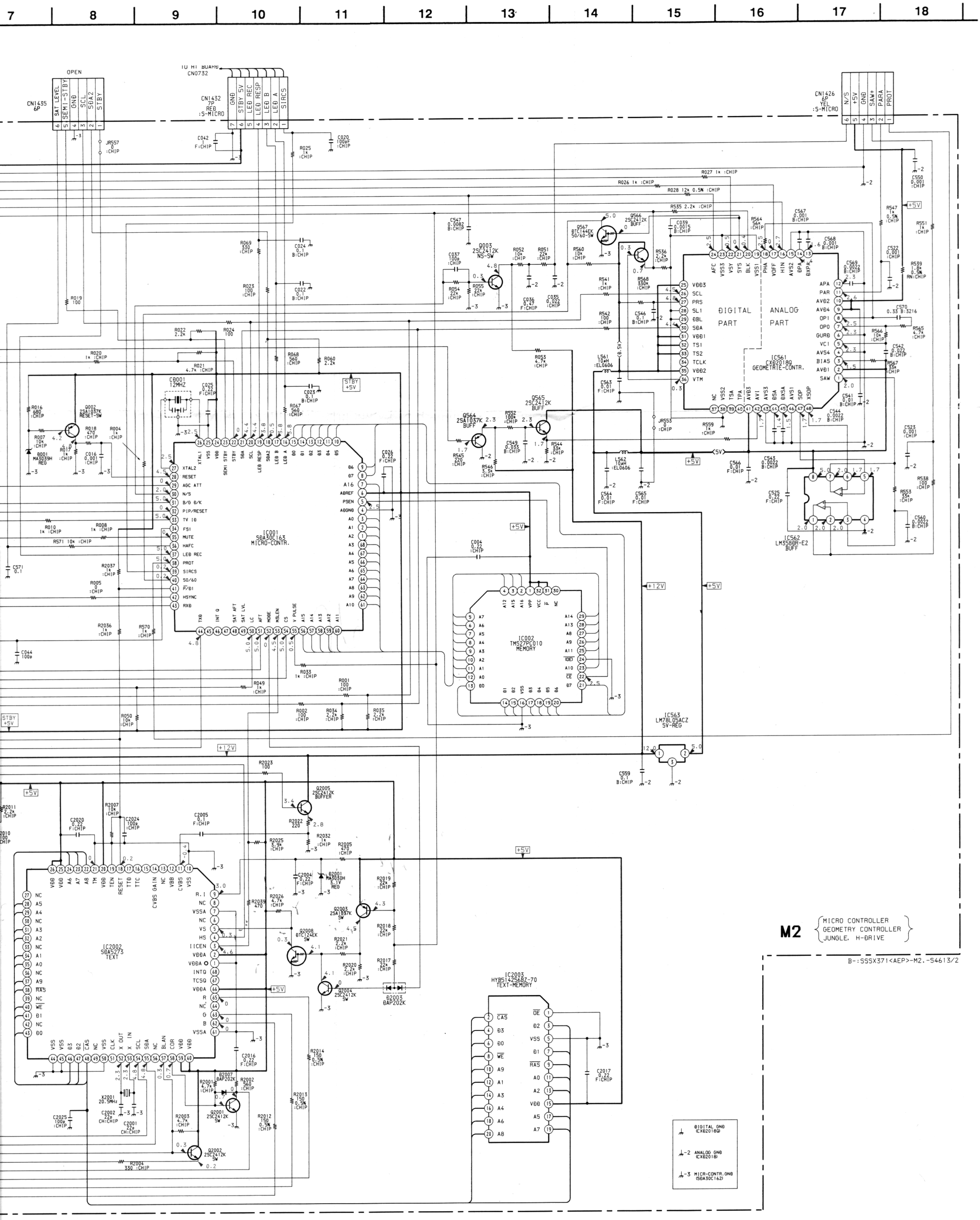
J [AUDIO IN/OUT, Y-CHROMA IN/OUT
VIDEO IN/OUT]

— J BOARD —



- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
OPEN
CN1435
6P
SAT LEVEL
SEMI-STBY
GND
SCL
SDA2
STBY
JR557
0
:CHIP
TO HI BOARD
CN0732
CN1432
7P
RED
:S-MICRO
GND
STBY 5V
LED REC
LED RESP
LED B
LED A
SIRCS
C042
1
F:CHIP
C020
100pF
:CHIP
R025
1k
:CHIP
STBY
+5V
C017
0.22
F:CHIP
L563
2.2μH
:EL0606
AGC ATT
DGND
B/G D/K
MUTE
PIP/RESET
ABL
TV ID
BLK
DGND
SCL
AFT
SDA
CS
V OFF
DGND
IK
SCL
V PULSE
SDA
V S/S
SYNC IN
FH
VIDEO
VLC
TVS
H PULSE
LC
H SYNC
5V STBY
TXT BLK
JGND
COR
J5V
R
12V
G
JGND
B
FS1
STBY
TO A BOARD
CN0113
CN1413
40P
WHT
:BTOB-P
R030
1k
:CHIP
R069
330
:CHIP
C024
0.1
B:CHIP
R023
100
:CHIP
C022
0.1
B:CHIP
R019
100
C007
100p
:CHIP
R022
2.2k
R024
100
R020
1k :CHIP
R021
4.7k :CHIP
R068
560
:CHIP
R060
2.2k
CD001
12MHZ
C025
0.22
F:CHIP
C023
0.1
B:CHIP
STBY
+5V
R067
560
:CHIP
R016
680
:CHIP
Q002
2SA1037K
RESET-SW
R007
10k
:CHIP
D001
MA3039H
REG
R018
470
:CHIP
R017
1k
:CHIP
C016
0.001
:CHIP
R004
1k
:CHIP
C001
100p
:CHIP
C014
100p
:CHIP
R014
1k :CHIP
C012
100p
:CHIP
R012
1k :CHIP
C011
100p
:CHIP
R011
1k :CHIP
C528
33p
:CHIP
C529
33p
:CHIP
C2021
68p
:CHIP
C524
68p
:CHIP
R010
1k :CHIP
R008
1k :CHIP
C010
100p
:CHIP
R571 10k :CHIP
C008
100p
:CHIP
C571
0.1
C026
0.22
F:CHIP
XTAL2
RESET
AGC ATT
N/S
B/G D/K
PIP/RESET
TV ID
FS1
MUTE
HAFC
LED REC
PROT
SIRCS
50/60
P̄/D1
HSYNC
RXD
XTAL1
VSS
VDD
SEMI STBY
STBY
SDA
SCL
SDA2
LED RESP
LED B
LED A
D0
D1
D2
D3
D4
D5
D6
D7
A16
ABREF
PSEN
ABGND
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
TXD
INT Q
SAT AFT
SAT LVL
LC
AFT
MODE
MSLEN
CS
V PULSE
A15
A14
A13
A12
A11
IC001
SDA30C163
MICRO-CONTR.
JR551
0
:CHIP
R2037
1k
:CHIP
R005
0
:CHIP
R032
1k :CHIP
C032
100p
:CHIP
R071
1k
C044
100p
R2036
1k
:CHIP
R570
1k
:CHIP
+12V
R038
10k :CHIP
R003
1k
:CHIP
R049
1k
:CHIP
R033
1k :CHIP
R001
100
:CHIP
L001
100μH :EL0606
C018
2.2
F:CHIP
C019
22
50V
STBY
+5V
C2027
0.22
F:CHIP
R050
1k
:CHIP
R002
100
:CHIP
R034
2.2k
:CHIP
R035
2.2k
:CHIP
+5V
+12V
L2001
82μH
:EL0606
R2023
100
+5V
Q2005
2SC2412K
BUFFER
C2018
2.2
F:CHIP
C2019
22
50V
C2008
0.22
F:CHIP
R2009
2.2k
:CHIP
R2011
2.2k
:CHIP
R2007
10k
:CHIP
C2020
0.22
F:CHIP
C2024
100p
:CHIP
C2005
0.1
F:CHIP
R2022
220
R2025
3.9k
:CHIP
R2032
1k
:CHIP
R2005
470
:CHIP
R2008
100
:CHIP
R2010
100
:CHIP
Q2006
DTC144EK
SWITCH
VDD
VDD
A6
A7
A8
TM
VDD
TEN
RESET
TTD
TTC
CVBS GAIN
NC
VBB
CVBS
VSS
R.I
NC
VSSA
NC
VS
HS
IICEN
VDDA
VDDA
INTQ
TCSQ
VDDA
R
NC
G
B
VSSA
NC
A5
A4
NC
A3
A2
NC
A1
A0
NC
A9
RAS
NC
WE
D1
NC
D0
VSS
VSS
D3
D2
CAS
NC
VSS
CLK
X OUT
X IN
SCL
SDA
NC
BLAN
COR
VDD
VDD
IC2002
SDA5273
TEXT
C2004
0.22
F:CHIP
D2001
MA3030H
3.1V
REG
R2019
22k
:CHIP
R2026
4.7k
:CHIP
R2039
470
Q2003
2SA1037K
SW
Q2008
DTC124EK
SW
R2018
22k
:CHIP
R2021
2.2k
:CHIP
R2020
2.2k
:CHIP
R2017
22k
:CHIP
Q2004
2SC2412K
SW
D2003
DAP202K
+5V
R2040
1.8k
R2030
0
:CHIP
C2016
0.22
F:CHIP
R2014
150
0.5W
:CHIP
D2007
DAP202K
R2002
560
:CHIP
R2001
4.7k
:CHIP
Q2001
2SC2412K
SW
R2013
150
0.5W
:CHIP
X2001
20.5MHz
C2025
100p
:CHIP
C2002
22p
CH:CHIP
C2001
22p
CH:CHIP
R2003
4.7k
:CHIP
R2012
150
0.5W
:CHIP
Q2002
2SC2412K
SW
R2004
330 :CHIP



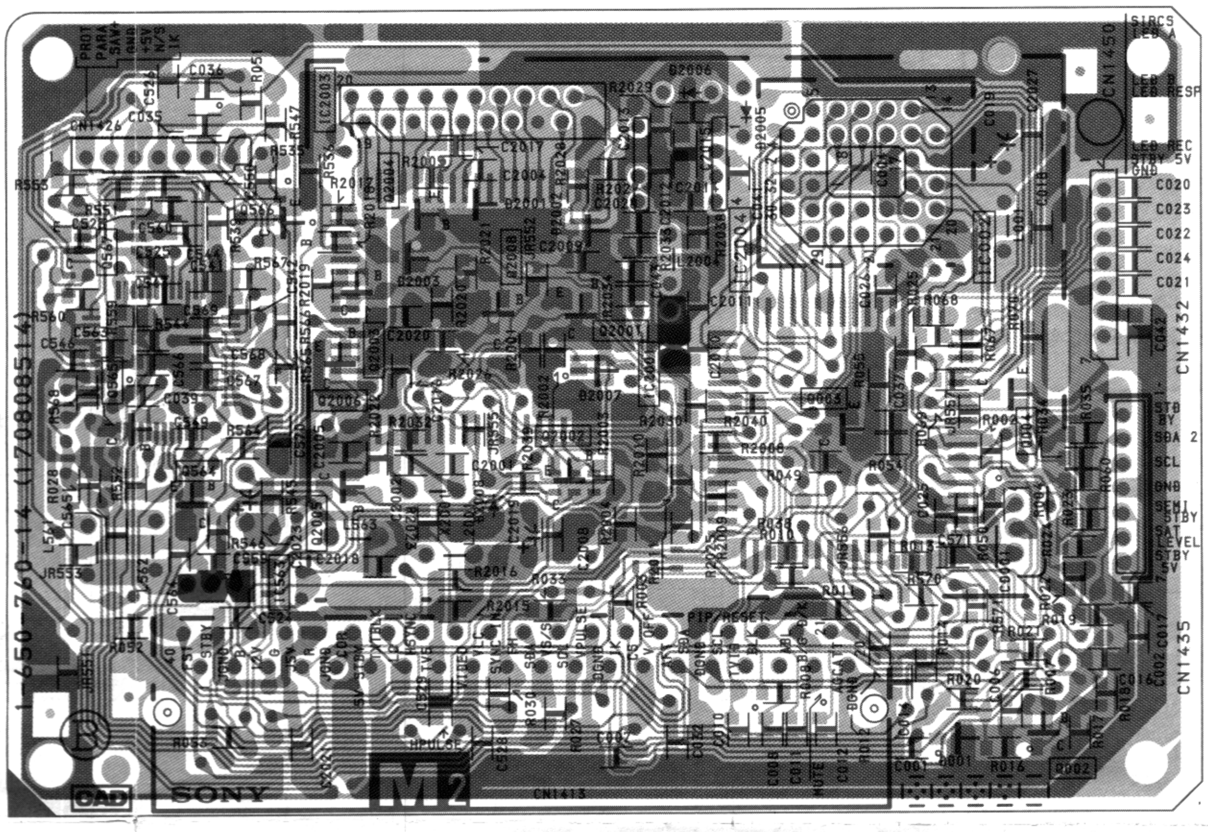
M2 MICRO CONTROLLER
GEOMETRY CONTROLLER
JUNGLE, H-DRIVE

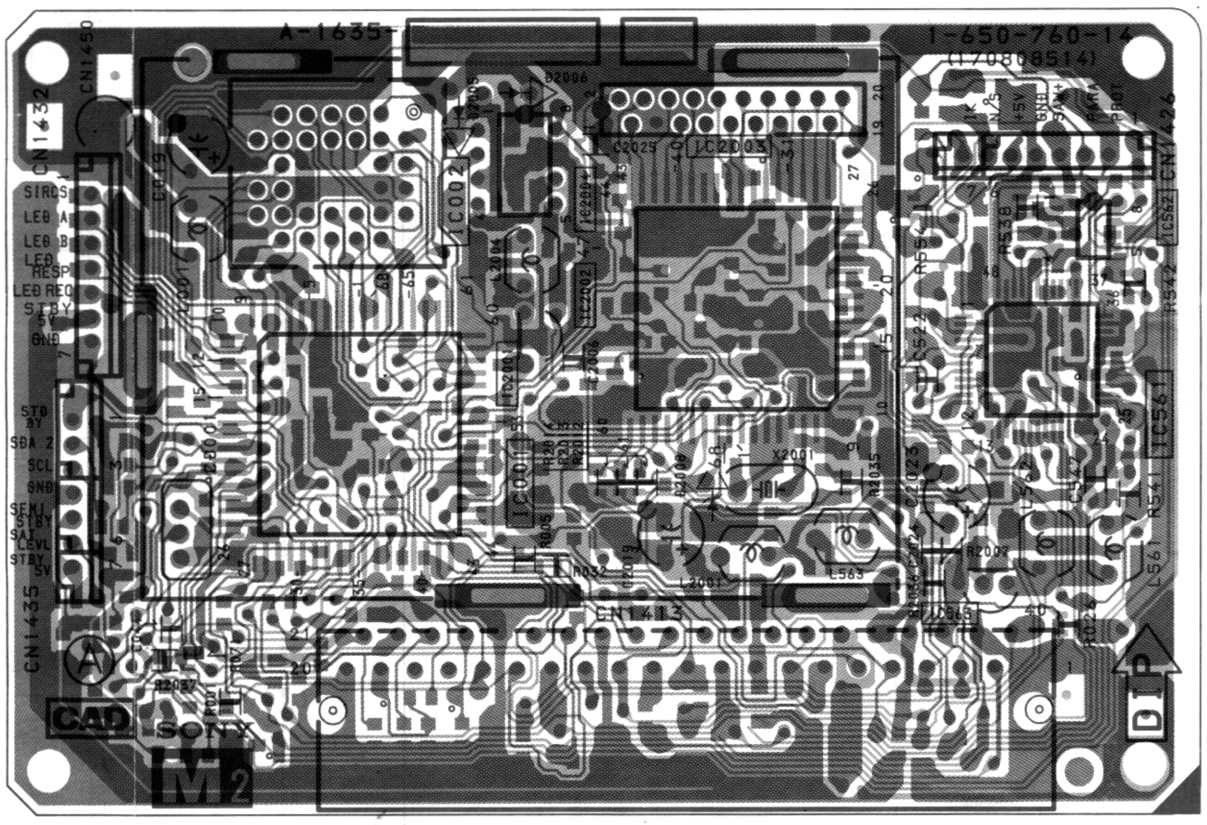
B-:SSSX371<AEP>-M2.-S4613/2

⏚	DIGITAL GND (CXD2018Q)
⏚-2	ANALOG GND (CXD2018)
⏚-3	MICR-CONTR.GND (SDA30C162)

M2 [MICRO-CONTROLLER, GEOMETRY CONTROLLER JUNGLE, H-DRIVE]

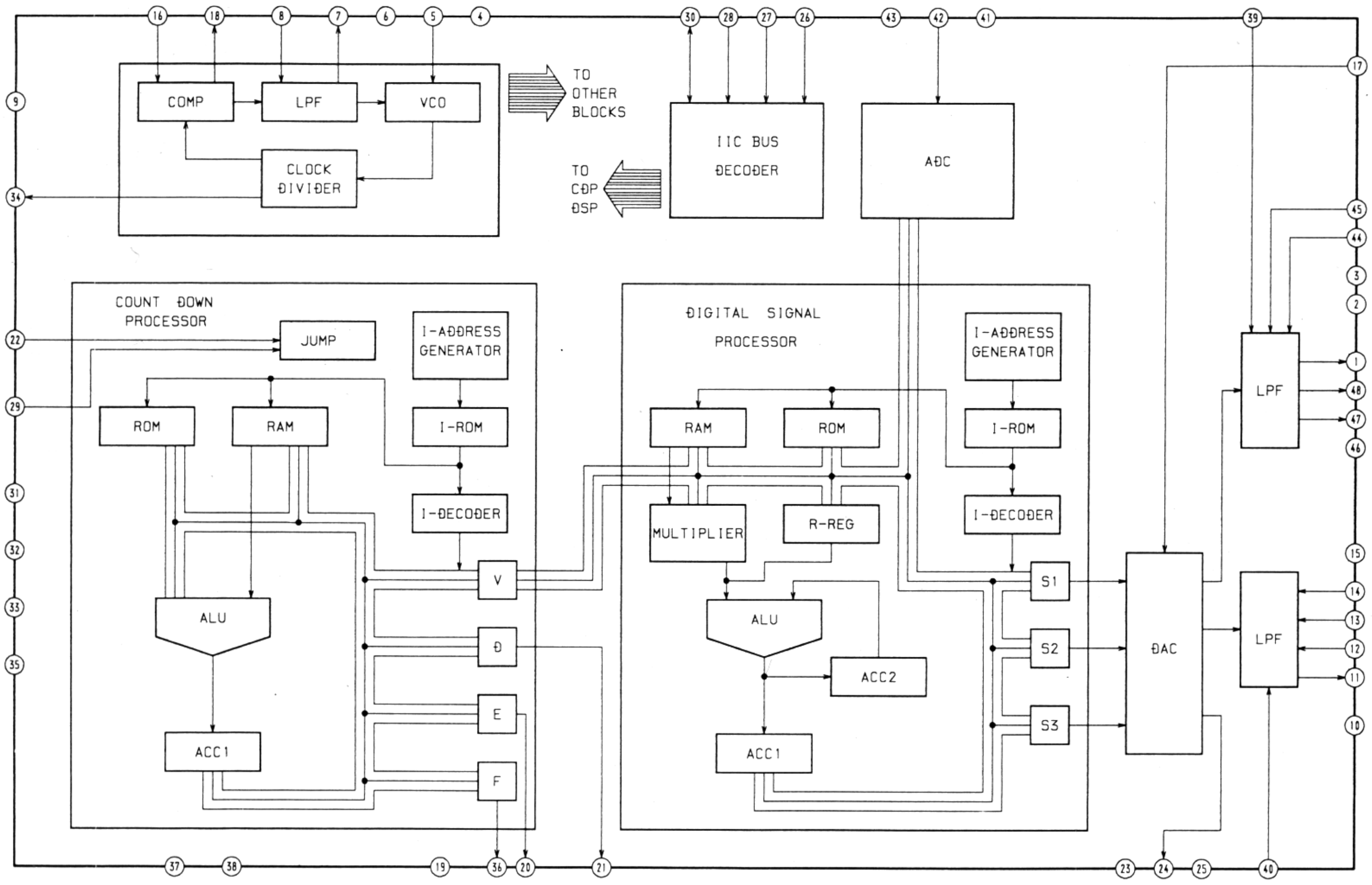
— M2 BOARD —

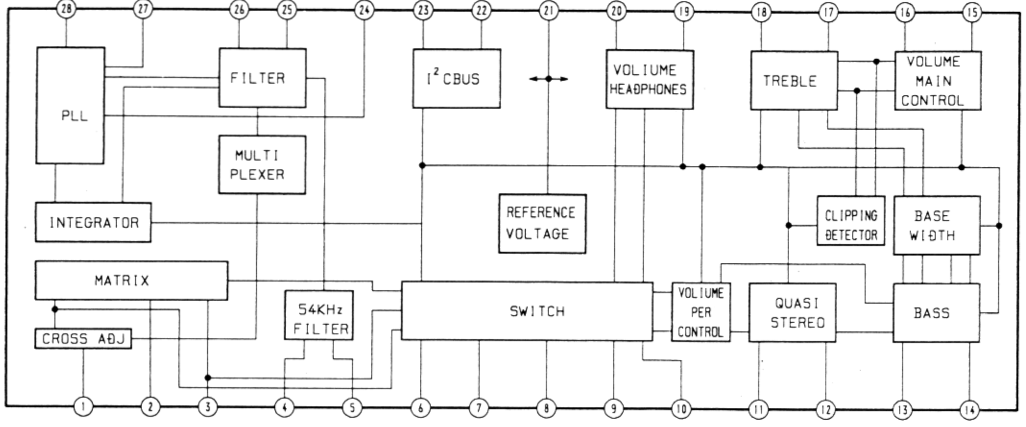


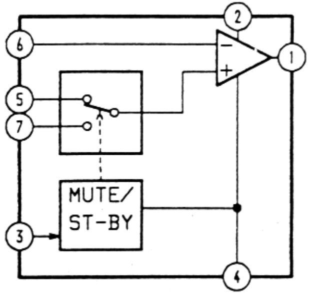


- ░ : Pattern from the side which enables seeing.
- ▓ : Pattern of the rear side.

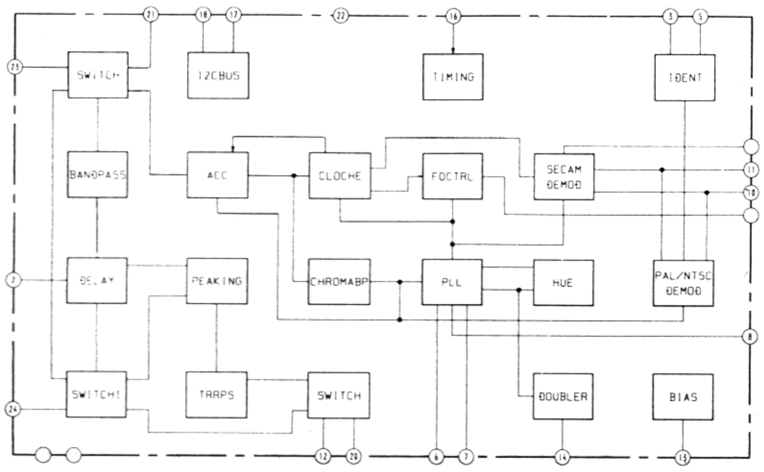
M2 BOARD IC561 CXD2018Q



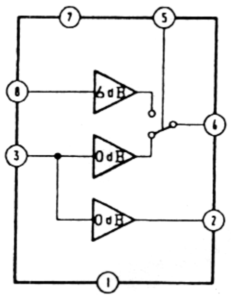




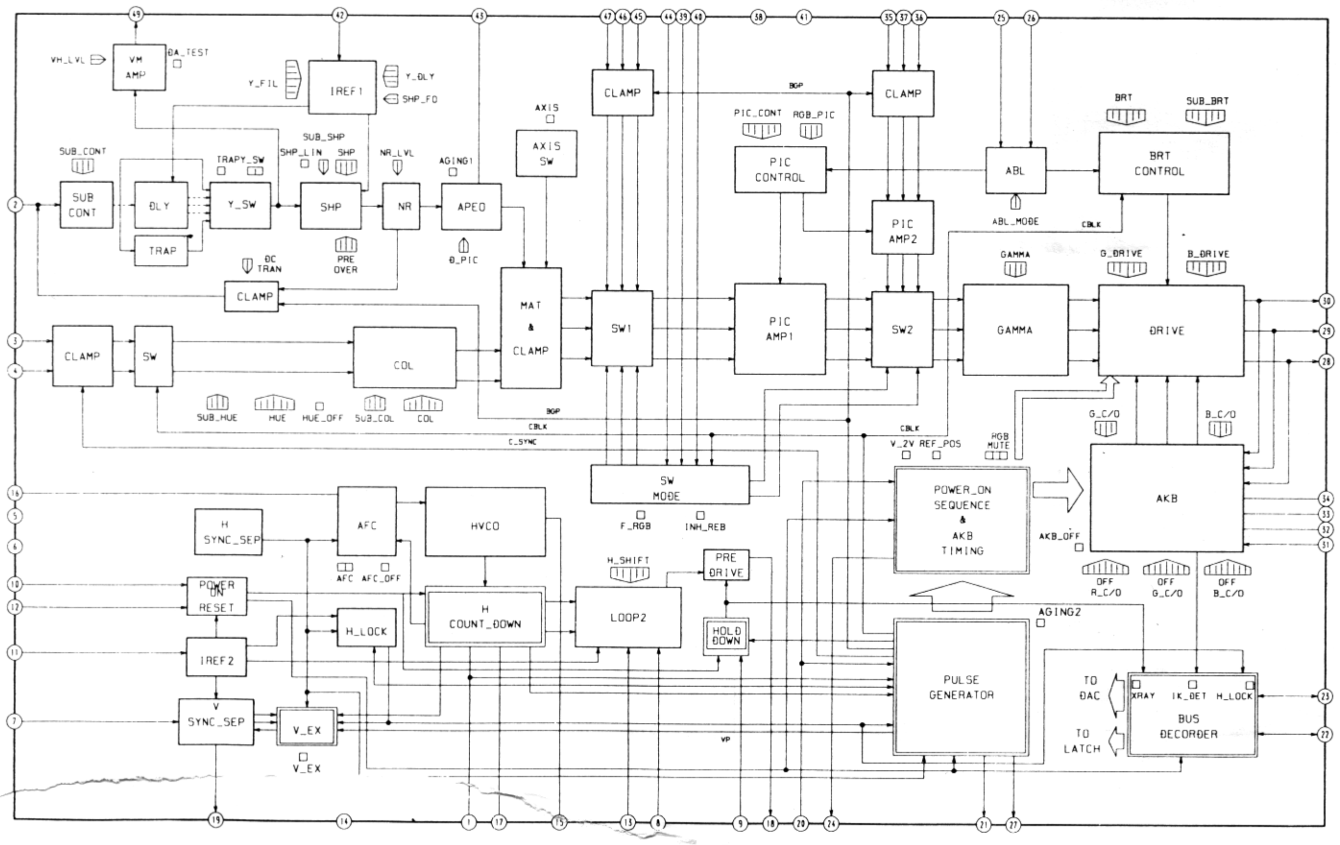
A BOARD IC301 TDA9145/N2B



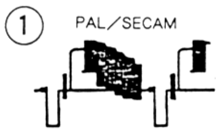
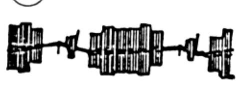
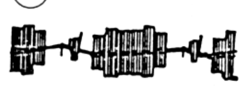
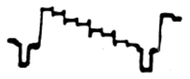
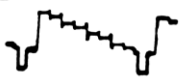
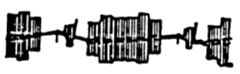
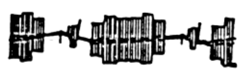
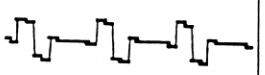
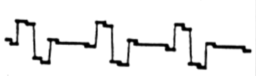
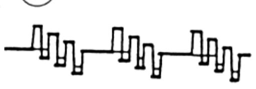
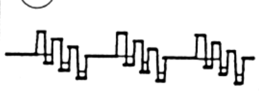
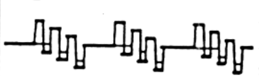
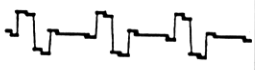
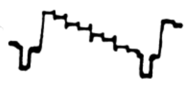
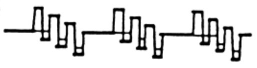
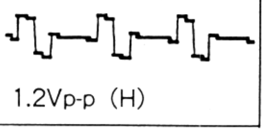
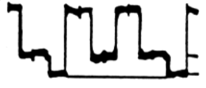
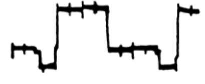
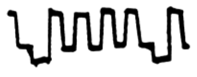
A BOARD IC402 TEA2114

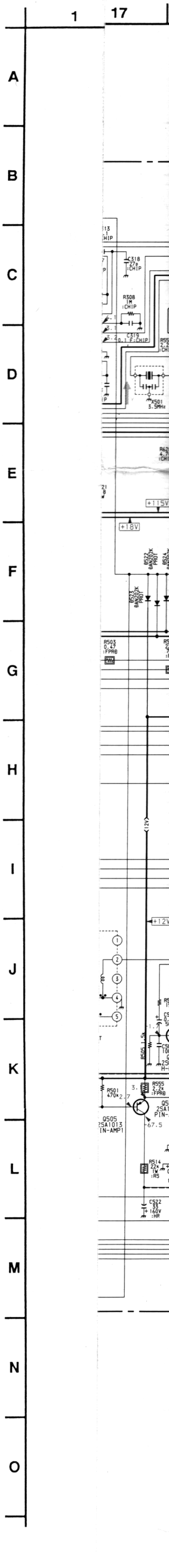


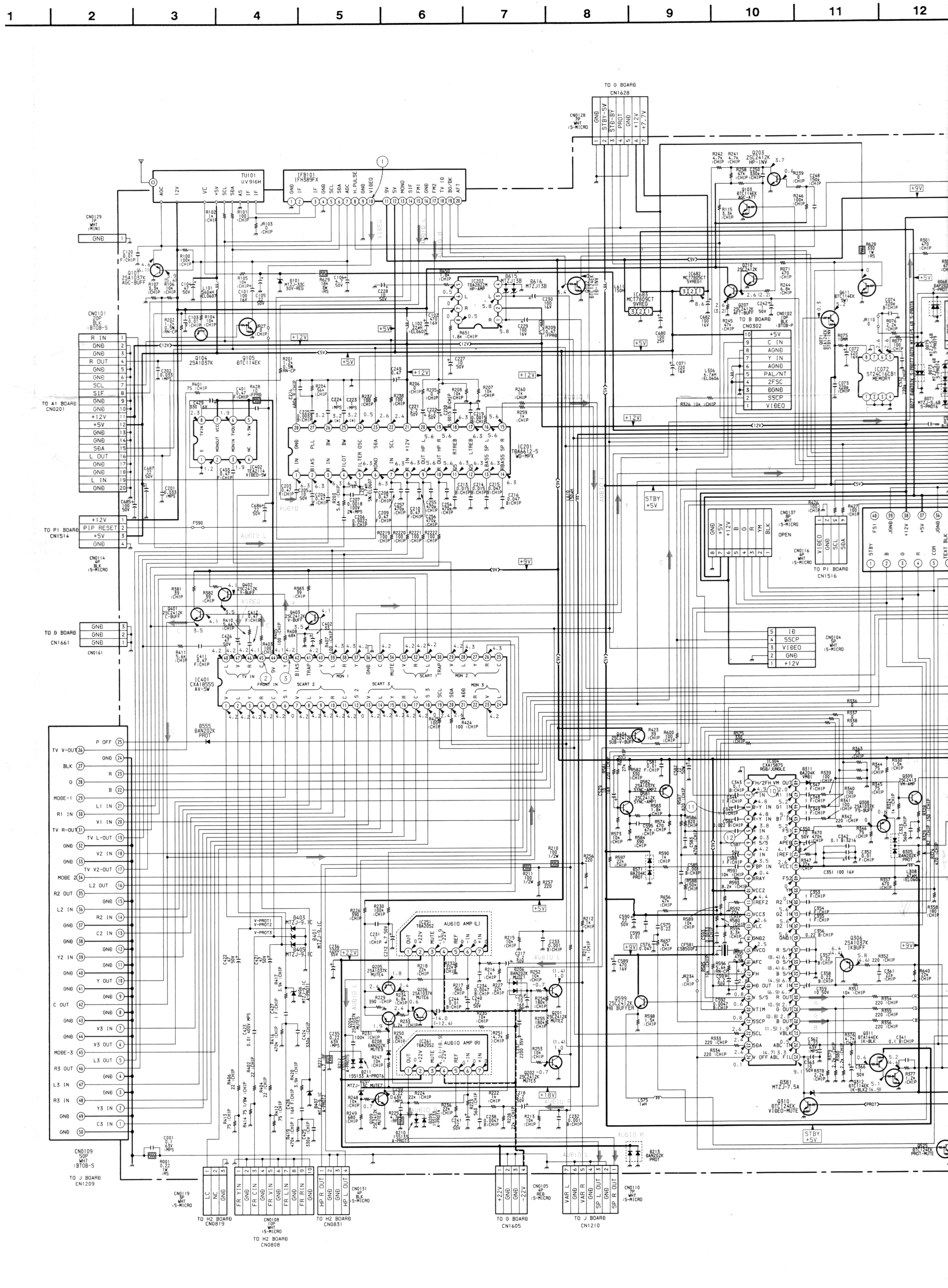
A BOARD IC304 CXA1587S



WAVEFORMS A BOARD

① PAL/SECAM  1.1Vp-p (H)	② PAL  1.3Vp-p (H)	② SECAM  0.4Vp-p (H)	③ PAL/SECAM  1.8Vp-p (H)
④ PAL/SECAM  1.3Vp-p (H)	⑤ PAL  0.6Vp-p (H)	⑤ SECAM  2.2Vp-p (H)	⑥ PAL  0.7Vp-p (H)
⑥ SECAM  1.2Vp-p (H)	⑦ PAL  0.8Vp-p (H)	⑦ SECAM  1.6Vp-p (H)	⑧ PAL/SECAM  1.6Vp-p (H)
⑨ PAL/SECAM  1.3Vp-p (H)	⑩ PAL/SECAM  0.4Vp-p (H)	⑪ PAL/SECAM  1.6Vp-p (H)	⑫ PAL/SECAM  1.2Vp-p (H)
⑬ PAL/SECAM  3.0Vp-p (H)	⑭ PAL/SECAM  3.0Vp-p (H)	⑮ PAL/SECAM  3.0Vp-p (H)	




1
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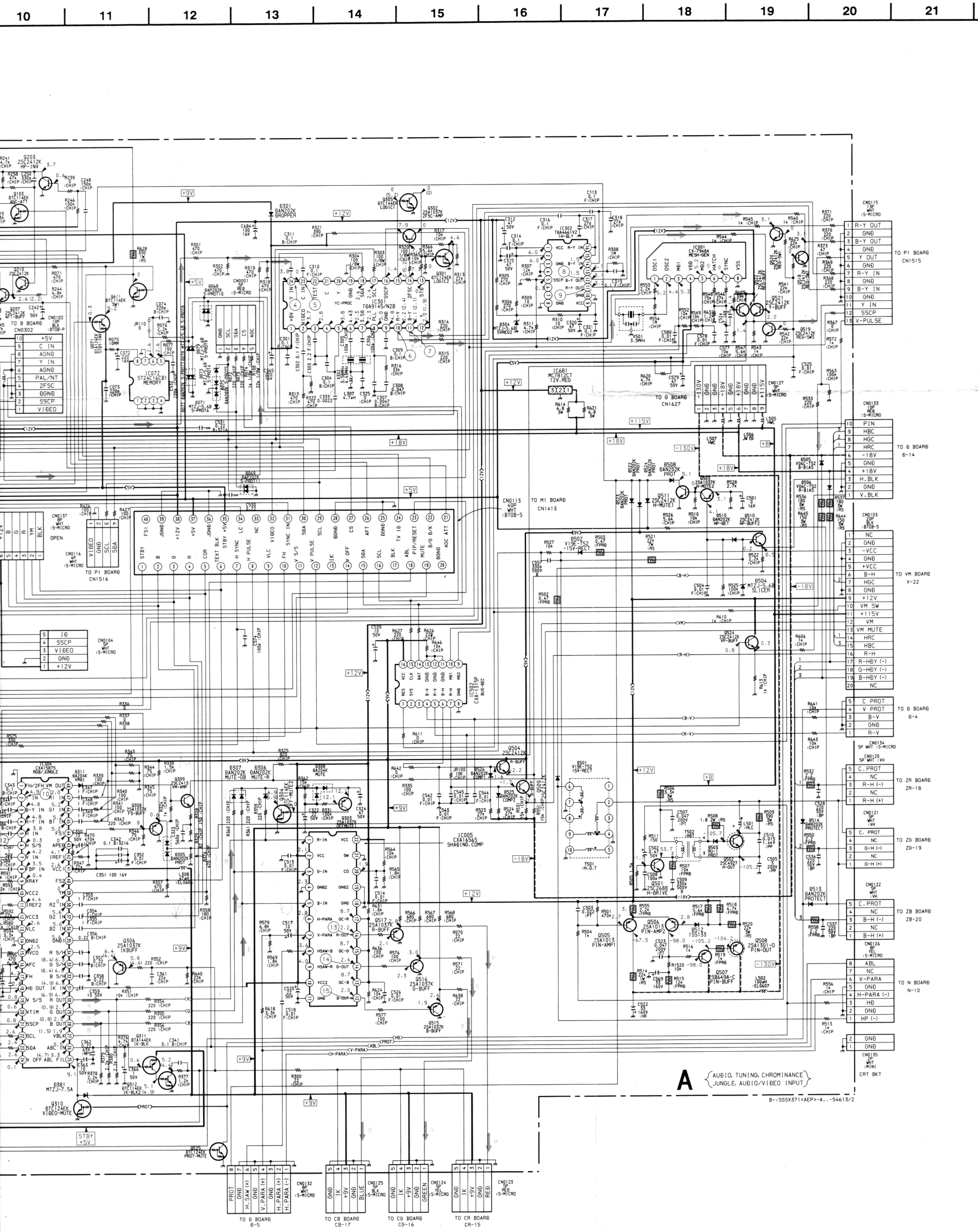
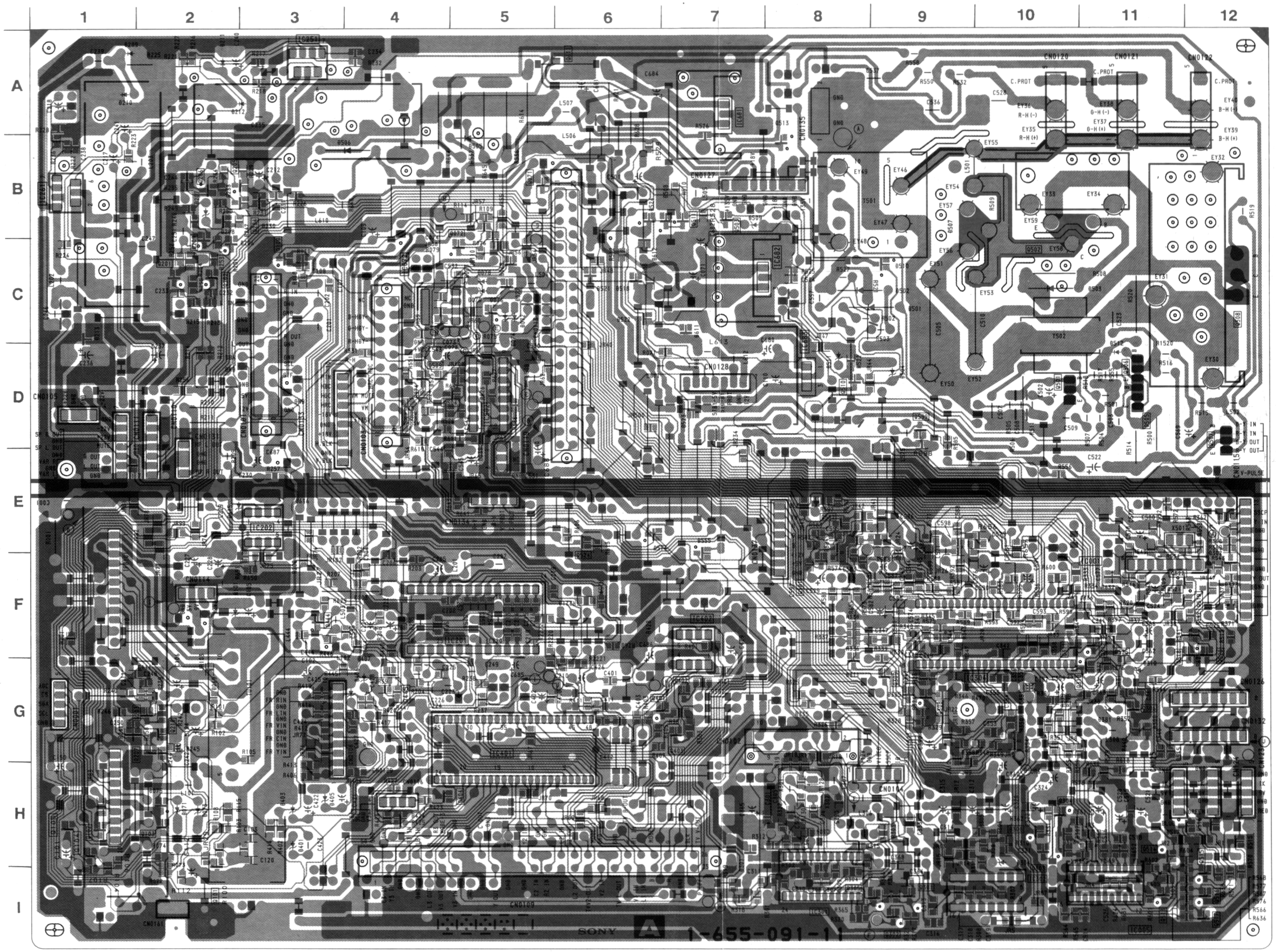
11
12
TO G BOARD CN1628
CN0128 7P WHT :S-MICRO
TU101 UV916H
IFB101 IFH389FX
IC202 TDA2822M HP-AMP
IC683 MCT7809CT 9VREG
IC682 MCT7805CT 5VREG1
IC201 TDA6612-5 WG-MPX
IC402 TEA2114 VIDEO-SW
IC401 CXA1855S AV-SW
IC072 ST24C16CB1 MEMORY
IC304 CXA1587S RGB/JUNGLE
IC251 TDA2052 AUDIO AMP (L)
IC261 TDA2052 AUDIO AMP (R)
CN0129 1P WHT :MINI
CN0101 20P BLK :BTOB-S
TO A1 BOARD CN0201
TO P1 BOARD CN1514
CN0114 4P BLK :S-MICRO
TO G BOARD CN1661
CN0161
CN0109 50P WHT :BTOB-S
TO J BOARD CN1209
CN0119 3P WHT :S-MICRO
TO H2 BOARD CN0819
CN0108 10P WHT :S-MICRO
TO H2 BOARD CN0808
CN0131 4P BLK :S-MICRO
TO H2 BOARD CN0831
CN0105 4P RED :S-MICRO
TO G BOARD CN1605
CN0110 7P WHT :S-MICRO
TO J BOARD CN1210
TO B BOARD CN0302
CN0102 10P BLK :BTOB-P
CN0137 8P WHT :S-MICRO OPEN
CN0116 4P WHT :S-MICRO
TO P1 BOARD CN1516
CN0104 5P WHT :S-MICRO
STBY +5V
+12V
+5V
+9V
+22V
+18V


10
11
12
13
14
15
16
17
18
19
20
21
A
AUDIO, TUNING, CHROMINANCE
JUNGLE, AUDIO/VIDEO INPUT
B-:SSSX371<AEP>-A..-S4613/2
IC301 TDA9145/N2B YC-PROC
IC302 TBA4661V2 (H-BLT)
IC001 CX-7948A RESH-GEN
IC681 MC7812CT 12V.REG
IC072 ST24C16CB1 MEMORY
IC502 CXA-1315P BUS-DEC
IC005 CXA1656S SHADING.COMP
IC604 CXA1587S RGB/JUNGLE
CN0115 13P WHT :S-MICRO
R-Y OUT
GND
B-Y OUT
GND
Y OUT
GND
R-Y IN
GND
B-Y IN
GND
Y IN
SSCP
V-PULSE
TO P1 BOARD CN1515
CN0133 10P RED :S-MICRO
PIN
HBC
HGC
HRC
-18V
GND
+18V
H.BLK
GND
V.BLK
TO D BOARD D-14
CN0103 20P BLK :BTOB-S
NC
GND
-VCC
GND
+VCC
B-H
HGC
GND
+12V
VM SW
+115V
VM
VM MUTE
HRC
HBC
R-H
R-HDY (-)
G-HDY (-)
B-HDY (-)
NC
TO VM BOARD V-22
C PROT
V PROT
B-V
GND
R-V
TO D BOARD D-4
CN0134 5P WHT :S-MICRO
CN0120 5P WHT :VH
C.PROT
NC
R-H (-)
NC
R-H (+)
TO ZR BOARD ZR-18
CN0121 5P WHT :VH
C. PROT
NC
G-H (-)
NC
G-H (+)
TO ZG BOARD ZG-19
CN0122 5P WHT :VH
C. PROT
NC
B-H (-)
NC
B-H (+)
TO ZB BOARD ZB-20
CN0126 8P YEL :S-MICRO
ABL
NC
V-PARA
GND
H-PARA (-)
HD
GND
HP (-)
TO N BOARD N-10
CN0135 2P WHT :MINI
GND
GND
CRT BKT
CN0113 40P WHT :BTOB-S
TO M1 BOARD CN1413
TO G BOARD CN1627
CN0127 9P WHT :S-MICRO
-130V
GND
+18V
GND
+115V
CN0102 10P BLK :BTOB-P
TO B BOARD CN0302
+5V
C IN
AGND
Y IN
AGND
PAL/NT
2FSC
DGND
SSCP
VIDEO
CN0137 8P WHT :S-MICRO
OPEN
CN0116 4P WHT :S-MICRO
VIDEO
GND
SCL
SDA
TO P1 BOARD CN1516
CN0104 5P WHT :S-MICRO
ID
SSCP
VIDEO
GND
+12V
CN0132 8P WHT :S-MICRO
PROT
GND
H. SAW (+)
GND
V.PARA (+)
GND
H.PARA (+)
H.PARA (-)
TO D BOARD D-5
CN0125 5P BLK :S-MICRO
GND
IK
+9V
GND
BLUE
TO CB BOARD CB-17
CN0124 5P YEL :S-MICRO
GND
IK
+9V
GND
GREEN
TO CG BOARD CG-16
CN0123 5P RED :S-MICRO
GND
IK
+9V
GND
RED
TO CR BOARD CR-15
T501 H.O.T
Q301 DTC144EK LOGIC2
Q302 2SA1037K 2FSC-AMP
Q305 DTC144EK LOGIC1
Q505 2SA1013 FIN-AMP1
Q506 2SA1013 PIN-AMP2
Q507 2SB649A-C PIN-BUFF
Q508 2SA1301-O PIN-OUT
Q501 2SC2688 H-DRIVE
Q502 2SC4927 H-OUT
Q521 2SC2412K Y-BUFF
Q519 2SC2412K REG-SW3
Q524 2SC2412K VP-BUFF
Q504 2SC2412K
Q515 2SA1037K B-BUFF
Q516 2SA1037K G-BUFF
Q517 2SA1037K R-BUFF
Q525 DTC124EK PROT-MUTE
Q310 DTC124EK VIDEO-MUTE
D381 MTZJ-7.5A
D301 DAN202K DROPPER
D501 V19E-TS2 15V-RECT
D502 V19E-TS2 -15V-RECT
D504 MTZJ-5.6B SLICER
D505 V06C-TS2 B-BIAS
D506 V06C-TS2 R-BIAS
D513 DAN202K PROTECT
D514 DAN202K PROTECT
X501 3.5MHz
L501 HLC
L502 100uH EL0607
+9V
+12V
+5V
+18V
+115V
-130V
-18V
+B
STBY +5V

A [AUDIO, TUNING, CHROMINANCE JUNGLE, AUDIO/VIDEO INPUT]

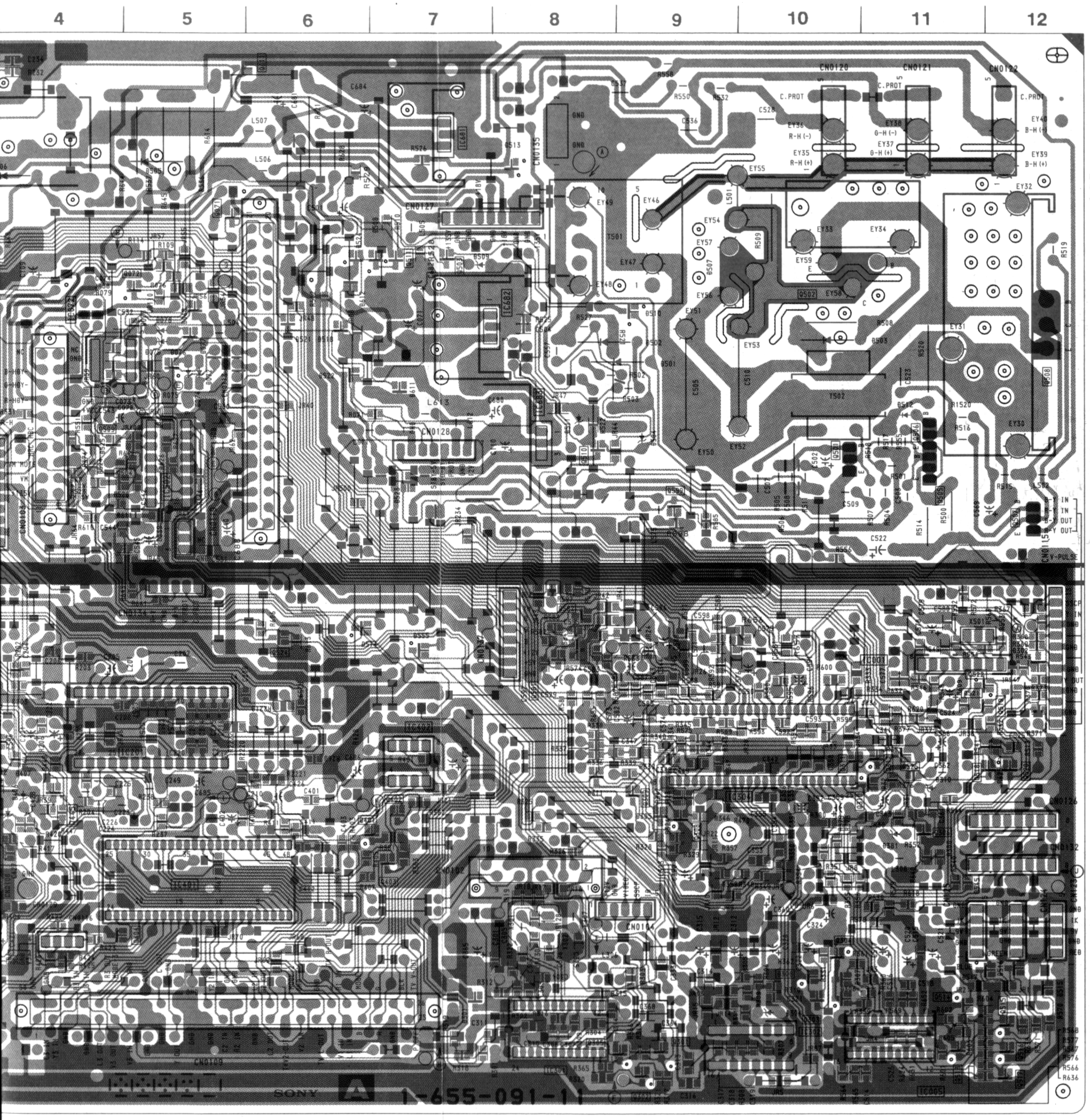
— A BOARD —



— A BOARD —

IC	
IC001	F-11
IC005	I-11
IC072	C-4
IC201	F-5
IC202	E-3
IC251	A-3
IC261	B-1
IC301	I-8
IC302	I-10
IC304	G-10
IC401	G-5
IC402	F-7
IC502	D-5
IC681	A-7
IC682	C-8
IC683	D-8
TRANSISTOR	
Q071	B-5
Q101	I-2
Q102	H-1
Q103	H-2
Q104	H-1
Q105	H-1
Q201	C-2
Q202	C-2
Q203	G-2
Q204	B-3
Q205	B-2
Q206	B-2
Q207	G-2
Q209	C-2
Q210	G-2
Q301	I-9
Q302	I-9
Q303	H-10
Q304	H-10
Q305	I-9
Q306	G-11
Q308	G-9
Q309	G-9
Q310	G-11

- ▨ : Pattern from the side which enables
- ▨ : Pattern of the rear side.



— A BOARD —

IC	
IC001	F-11
IC005	I-11
IC072	C-4
IC201	F-5
IC202	E-3
IC251	A-3
IC261	B-1
IC301	I-8
IC302	I-10
IC304	G-10
IC401	G-5
IC402	F-7
IC502	D-5
IC681	A-7
IC682	C-8
IC683	D-8

TRANSISTOR	
Q071	B-5
Q101	I-2
Q102	H-1
Q103	H-2
Q104	H-1
Q105	H-1
Q201	C-2
Q202	C-2
Q203	G-2
Q204	B-3
Q205	B-2
Q206	B-2
Q207	G-2
Q209	C-2
Q210	G-2
Q301	I-9
Q302	I-9
Q303	H-10
Q304	H-10
Q305	I-9
Q306	G-11
Q308	G-9
Q309	G-9
Q310	G-11
Q311	F-10
Q312	F-11
Q401	G-7
Q402	G-7
Q403	G-7
Q404	H-4
Q501	D-10
Q502	C-10
Q503	B-7
Q504	D-4
Q505	D-11
Q506	D-11
Q507	D-12
Q508	C-12
Q509	D-4
Q510	D-8
Q511	B-7
Q515	I-12
Q516	I-12
Q517	I-12
Q518	F-12
Q519	F-12
Q520	F-12
Q521	F-12
Q522	F-12
Q524	F-6
Q525	F-11
Q581	F-8
Q582	E-8
Q599	D-9
Q611	A-6

DIODE	
D068	C-5
D069	G-2
D071	H-2
D073	H-2
D075	H-2
D077	C-5
D078	C-5
D079	C-5
D101	F-2
D206	C-2
D207	B-2
D208	B-2
D209	A-1
D210	A-1
D211	A-2
D212	A-2
D213	C-1
D301	H-7
D304	H-10
D305	G-9
D306	H-10
D307	H-10
D308	H-10
D311	G-8
D381	G-11
D401	H-3
D403	H-3
D405	H-3
D406	G-4
D407	G-4
D501	C-9
D502	C-9
D503	C-10
D504	D-9
D505	B-5
D506	B-3
D508	B-7
D510	C-9
D512	D-11
D513	A-8
D514	E-6
D522	C-6
D523	D-7
D524	B-6
D525	D-4
D526	D-4
D555	E-7
D571	E-9
D615	E-2
D616	E-3

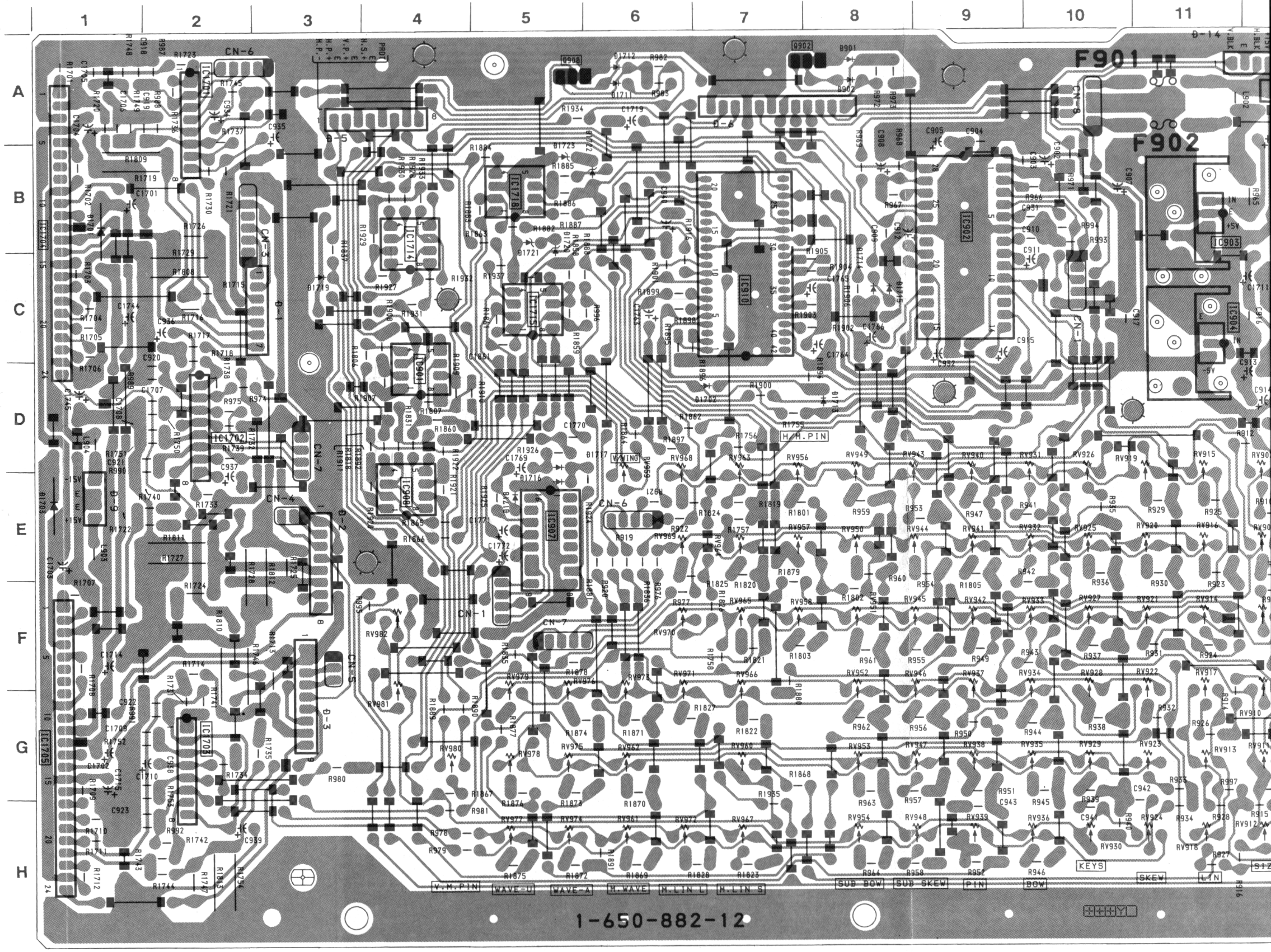
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.

— D BOARD —

IC	
IC901	D-4
IC902	B-9
IC903	B-11
IC904	C-11
IC905	C-12
IC906	B-12
IC907	E-5
IC908	E-4
IC910	C-7
IC1701	A-2
IC1702	D-2
IC1703	G-2
IC1704	B-2
IC1705	G-1
IC1706	C-14
IC1707	E-14
IC1708	H-14
IC1709	F-15
IC1710	D-15
IC1714	B-4
IC1715	C-5
IC1718	B-5
TRANSISTOR	
Q902	A-7
Q906	B-13
Q907	B-13
Q908	A-5
Q909	C-13
Q910	B-15
Q911	C-15
Q912	C-14
DIODE	
D901	A-8
D902	A-8
D1702	D-7
D1704	C-14
D1705	F-14
D1706	H-14
D1707	A-13
D1708	A-13
D1709	G-13
D1710	D-14
D1711	A-6
D1712	A-6
D1713	D-8
D1714	C-8
D1715	C-8
D1716	E-5
D1717	D-5
D1718	E-5
D1720	B-5
D1721	B-5
D1722	B-6
D1723	B-5
VARIABLE RESISTOR	
RV901	D-12
RV902	E-12
RV903	F-12
RV904	F-12
RV905	G-12
RV906	H-12
RV907	D-12
RV908	E-12
RV909	F-12
RV910	G-12
RV911	G-12
RV912	H-12
RV913	G-11
RV914	F-11
RV915	D-11
RV916	E-11
RV917	F-12
RV918	H-11
RV919	D-11
RV920	E-11
RV921	F-11
RV922	F-11
RV923	G-11
RV924	H-11
RV925	E-10
RV926	D-10
RV927	F-10
RV928	F-10
RV929	G-10
RV930	H-10
RV931	D-10
RV932	E-10
RV933	F-10
RV934	F-10
RV935	G-10
RV936	H-10
RV937	F-9
RV938	G-9
RV939	H-9
RV940	D-9
RV941	E-9
RV942	F-9
RV943	D-9
RV944	E-9
RV945	F-9
RV946	F-9
RV947	G-9
RV948	H-9
RV949	D-8
RV950	E-8
RV951	F-8
RV952	F-8
RV953	G-8
RV954	H-8
RV956	D-7
RV957	E-7
RV958	F-7
RV959	D-6
RV961	H-6
RV962	G-6
RV963	D-7
RV964	E-7
RV965	F-7
RV966	F-7
RV967	H-7
RV968	D-6
RV969	E-6
RV970	F-6
RV971	F-6
RV972	H-6
RV973	F-6
RV974	H-5
RV975	G-5
RV976	F-5
RV977	H-5
RV978	G-5
RV979	F-5
RV980	G-4
RV981	G-4
RV982	F-4

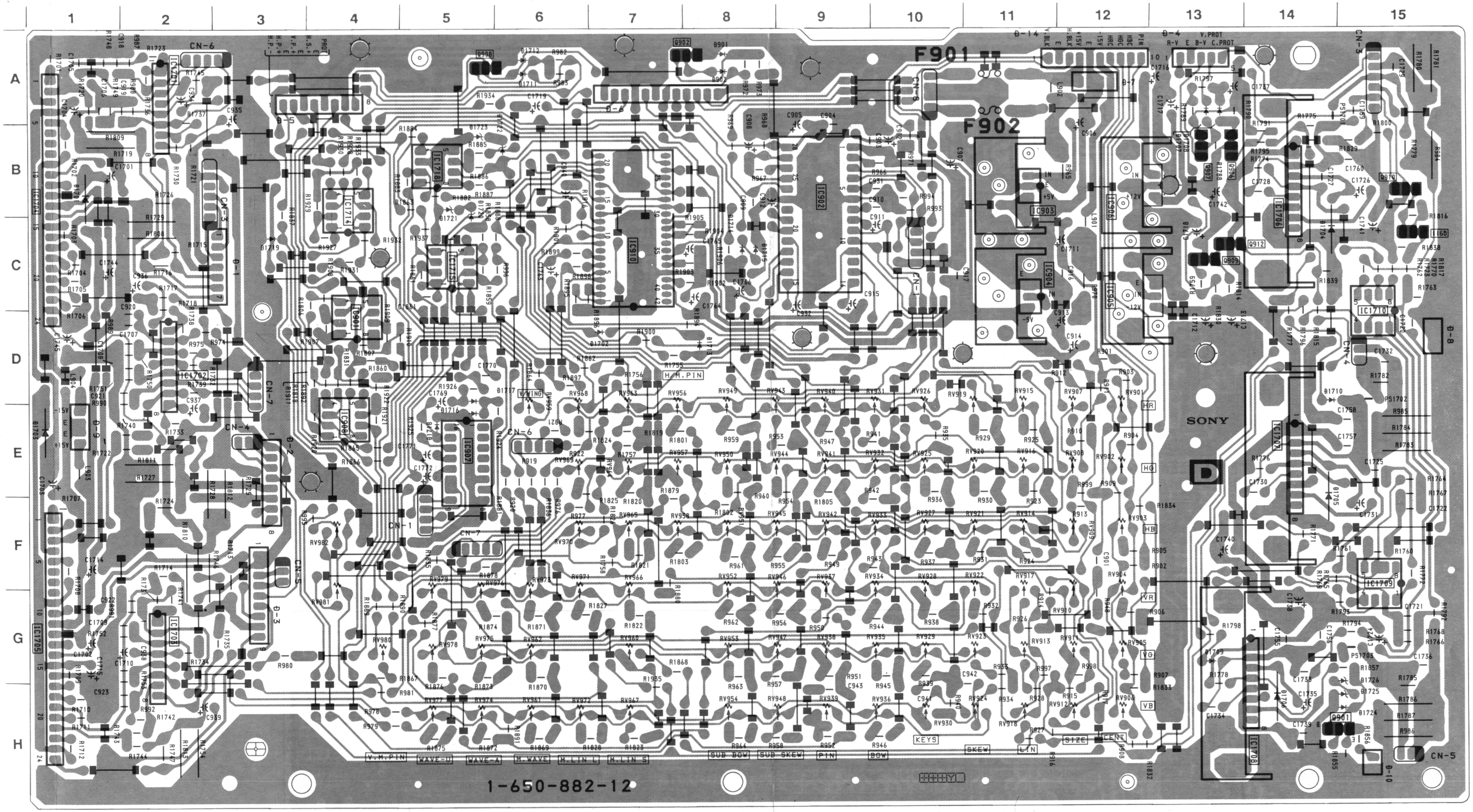
D [REGISTRATION, DEFLECTION, V-OUT, SUB-OUT]

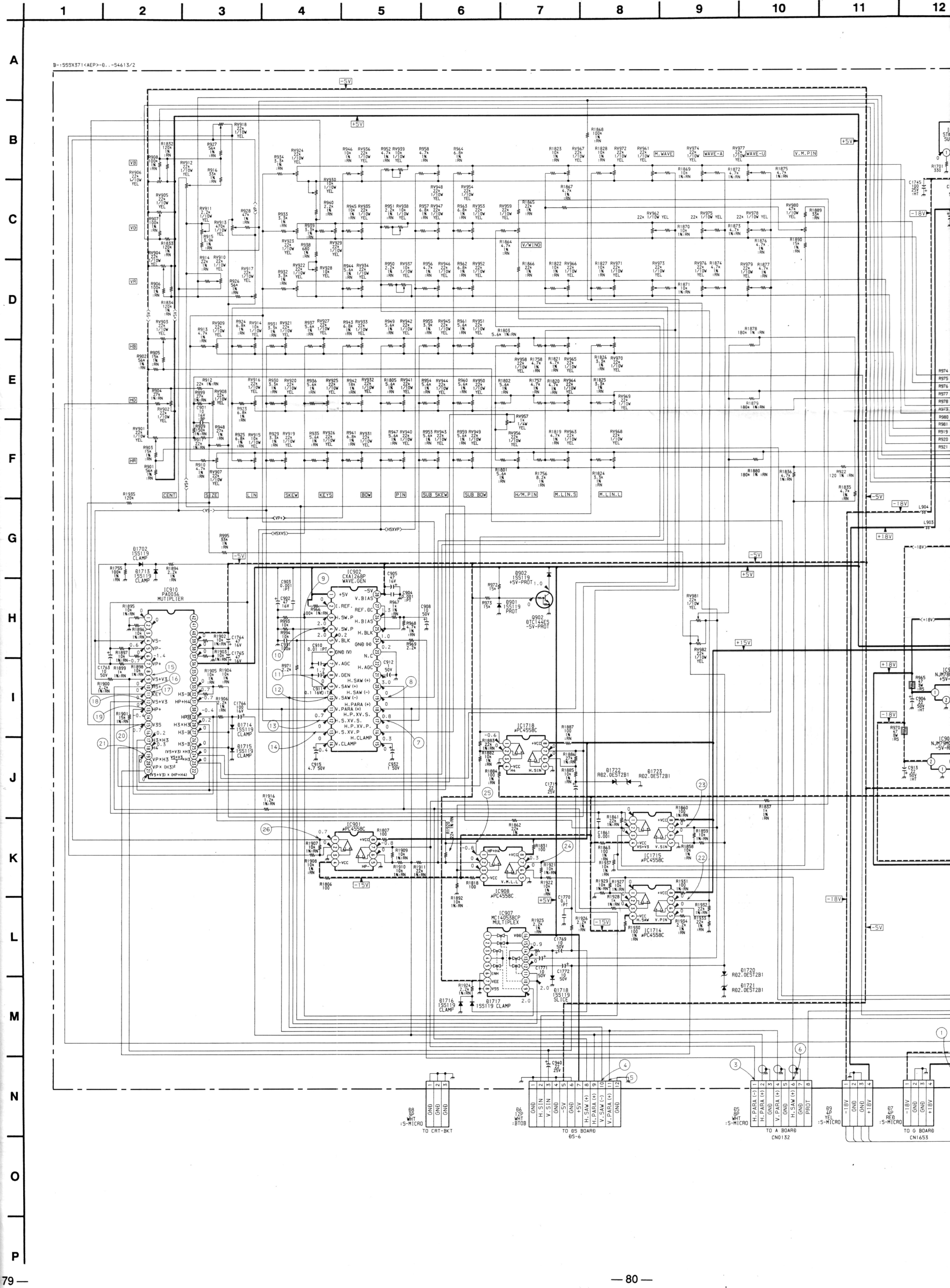
— D BOARD —



D REGISTRATION, DEFLECTION, V-OUT, SUB-OUT

— D BOARD —





1
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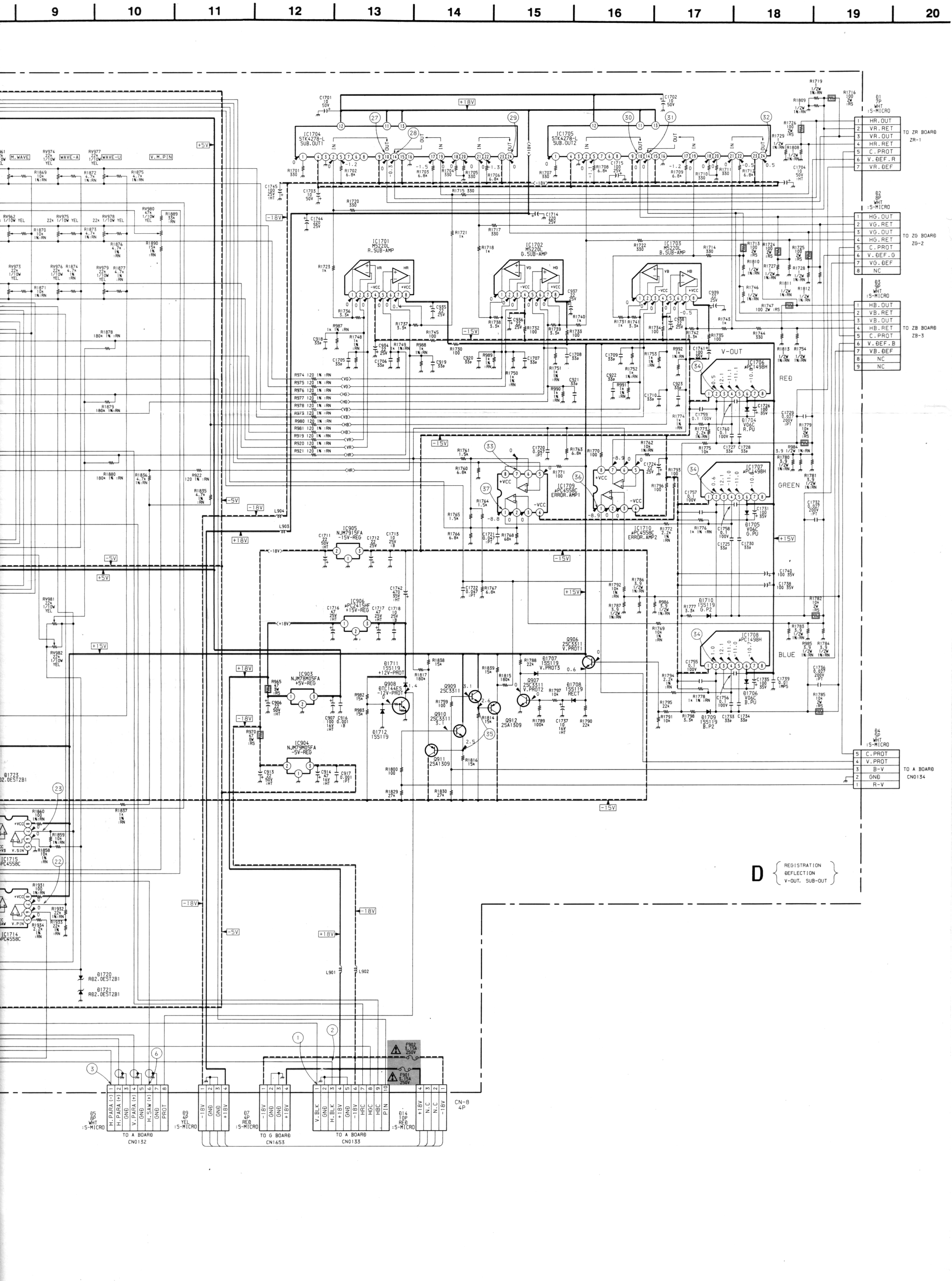
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
B-:S59X371<AEP>-B..-S4613/2
-5V
+5V
+5V
-18V
+18V
+15V
-15V
VB
VG
VR
HB
HG
HR
CENT
SIZE
LIN
SKEW
KEYS
BOW
PIN
SUB SKEW
SUB BOW
H/M.PIN
M.LIN.S
M.LIN.L
V/WING
M.WAVE
WAVE-A
WAVE-U
V.M.PIN
<VS->
<VP+>
<HSXVS>
<HSXVP>
D1702 1SS119 CLAMP
D1713 1SS119 CLAMP
IC910 PA0036 MULTIPLIER
IC902 CXA1268P WAVE.GEN
D902 1SS119 +5V-PROT
D901 1SS119 PROT
Q902 DTC144ES -5V-PROT
D1714 1SS119 CLAMP
D1715 1SS119 CLAMP
IC1718 µPC4558C
D1722 RD2.0ESB1
D1723 RD2.0ESB1
IC901 µPC4558C
IC908 µPC4558C
IC1715 µPC4558C
IC1714 µPC4558C
IC907 MC14053BCP MULTIPLEX
D1716 1SS119 CLAMP
D1717 1SS119 CLAMP
D1718 1SS119 SLICE
D1720 RD2.0ESB1
D1721 RD2.0ESB1
B8 3P WHT :S-MICRO
GND
GND
GND
TO CRT-BKT
B6 12P WHT :BTOB
GND
H.SIN
V.SIN
GND
-5V
GND
+5V
H.SAW (+)
GND
V.SAW (-)
V.SAW (+)
GND
TO B5 BOARD B5-6
B5 8P WHT :S-MICRO
H.PARA (-)
H.PARA (+)
GND
V.PARA (+)
GND
H.SAW (+)
GND
PROT
TO A BOARD CN0132
B9 4P YEL :S-MICRO
-18V
GND
GND
+18V
B7 4P RED :S-MICRO
-18V
GND
GND
+18V
TO G BOARD CN1653


9
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11
12
13
14
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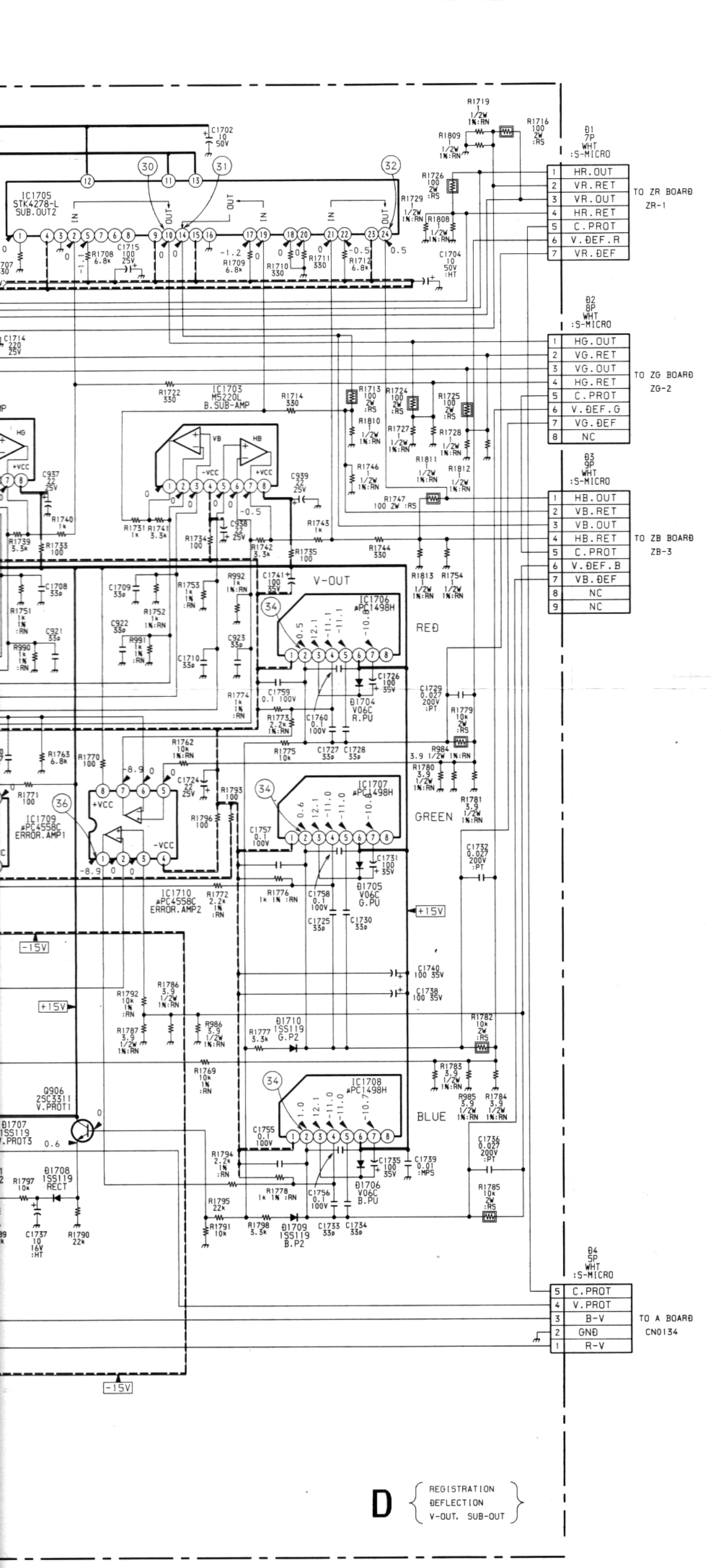
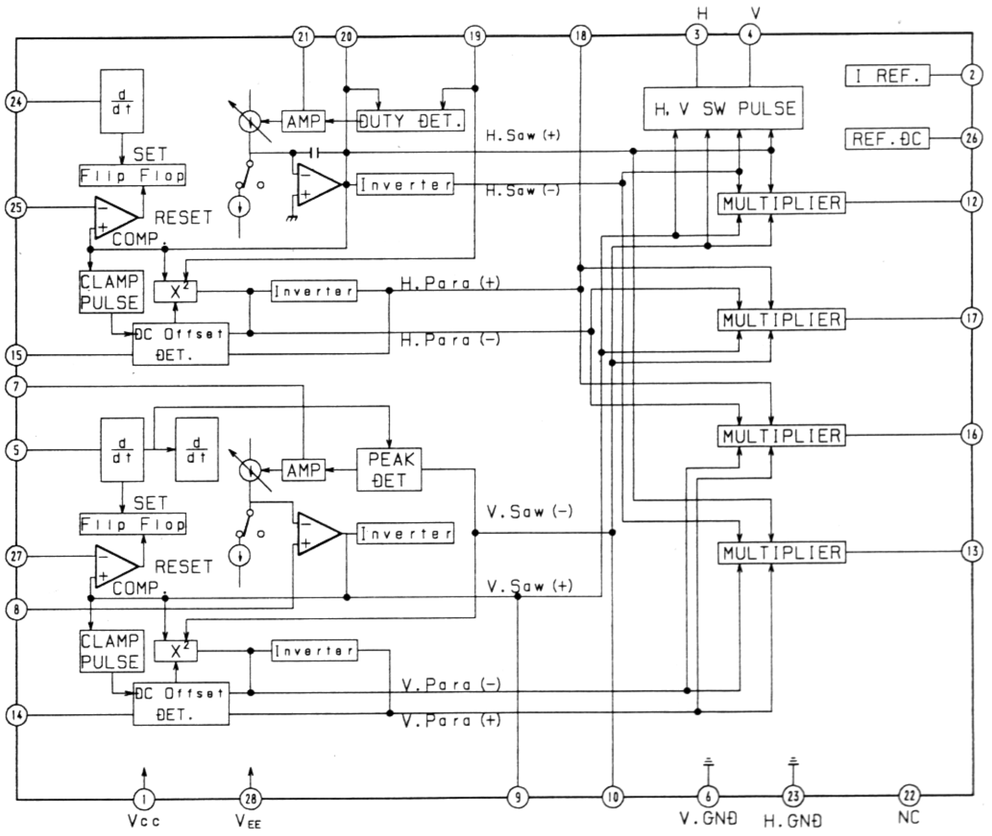
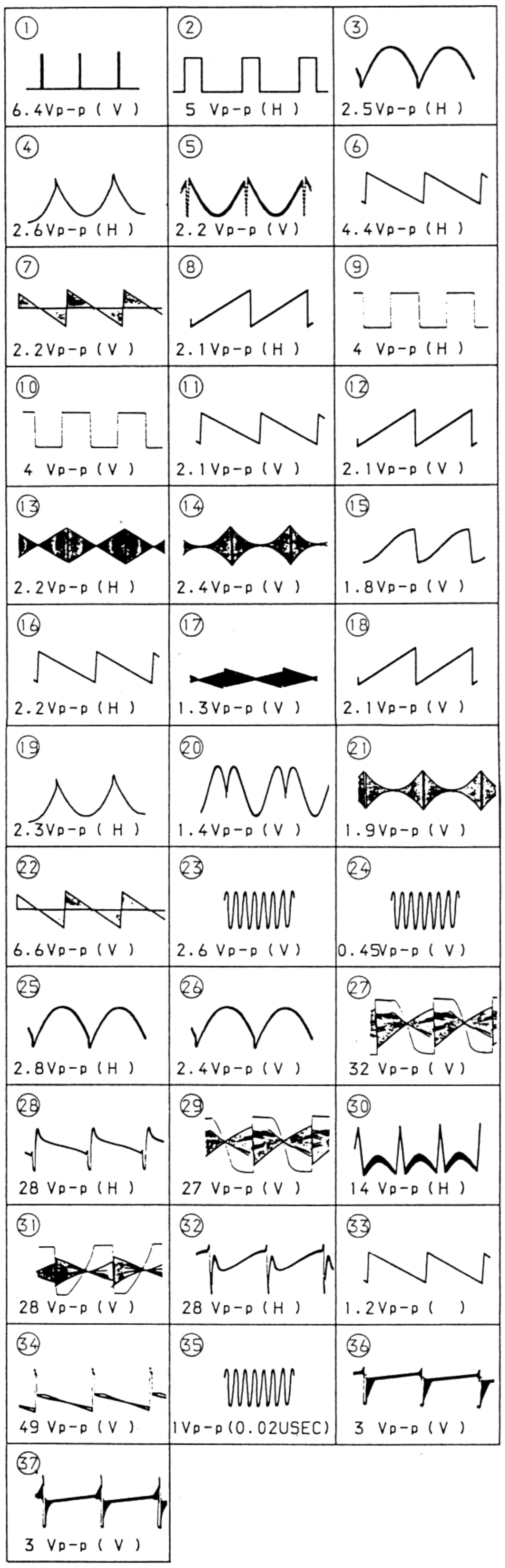
16
17
18
19
20
IC1704 STK4278-L SUB.OUT1
IC1705 STK4278-L SUB.OUT2
IC1701 M5220L R.SUB-AMP
IC1702 M5220L G.SUB-AMP
IC1703 M5220L B.SUB-AMP
IC1706 μPC1498H
IC1707 μPC1498H
IC1708 μPC1498H
V-OUT
RED
GREEN
BLUE
IC1709 μPC4558C ERROR.AMP1
IC1710 μPC4558C ERROR.AMP2
IC905 NJM7915FA -15V-REG
IC906 μPC2415HF +15V-REG
IC903 NJM78M05FA +5V-REG
IC904 NJM79M05FA -5V-REG
Q906 2SC3311 V.PROT1
Q907 2SC3311 V.PROT2
Q908 DTC144ES -12V-PROT
Q909 2SC3311
Q910 2SC3311
Q911 2SA1309
Q912 2SA1309
D1707 1SS119 V.PROT3
D1708 1SS119 RECT
D1711 1SS119 +12V-PROT
D1712 1SS119
D1704 V06C R.PU
D1705 V06C G.PU
D1706 V06C B.PU
D1709 1SS119 B.P2
D1710 1SS119 G.P2
D1720 RD2.0EST2B1
D1721 RD2.0EST2B1
D1723
IC1715 μPC4558C
IC1714 μPC4558C
M.WAVE
WAVE-A
WAVE-U
V.M.PIN
+18V
-18V
+15V
-15V
+5V
-5V
L901
L902
L903
L904
F901 3.15A 250V
F902 3.15A 250V
D1 7P WHT :S-MICRO
1 HR.OUT
2 VR.RET
3 VR.OUT
4 HR.RET
5 C.PROT
6 V.DEF.R
7 VR.DEF
TO ZR BOARD ZR-1
D2 8P WHT :S-MICRO
1 HG.OUT
2 VG.RET
3 VG.OUT
4 HG.RET
5 C.PROT
6 V.DEF.G
7 VG.DEF
8 NC
TO ZG BOARD ZG-2
D3 9P WHT :S-MICRO
1 HB.OUT
2 VB.RET
3 VB.OUT
4 HB.RET
5 C.PROT
6 V.DEF.B
7 VB.DEF
8 NC
9 NC
TO ZB BOARD ZB-3
D4 5P WHT :S-MICRO
5 C.PROT
4 V.PROT
3 B-V
2 GND
1 R-V
TO A BOARD CN0134
D5 8P WHT :S-MICRO
1 H.PARA (-)
2 H.PARA (+)
3 GND
4 V.PARA (+)
5 GND
6 H.SAW (+)
7 GND
8 PROT
TO A BOARD CN0132
D9 4P YEL :S-MICRO
1 -18V
2 GND
3 GND
4 +18V
D7 4P RED :S-MICRO
1 -18V
2 GND
3 GND
4 +18V
TO G BOARD CN1653
1 V.BLK
2 GND
3 H.BLK
4 +18V
5 GND
6 -18V
7 HRC
8 HGC
9 HBC
10 PIN
TO A BOARD CN0133
D14 10P RED :S-MICRO
4 +18V
3 N.C
2 N.C
1 -18V
CN-8 4P
D
REGISTRATION
DEFLECTION
V-OUT, SUB-OUT

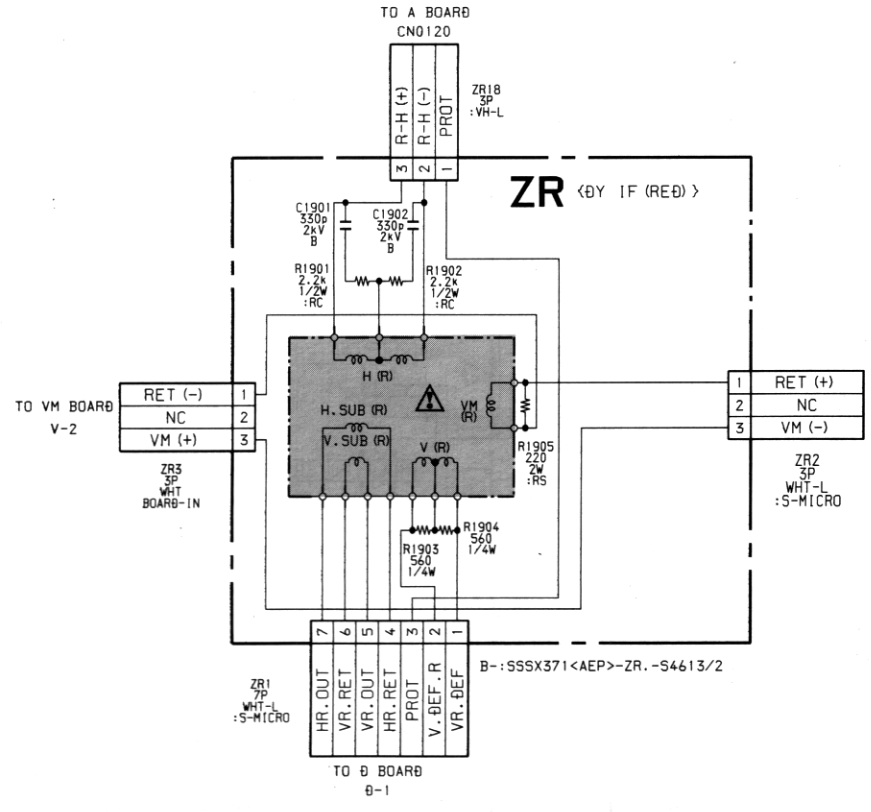


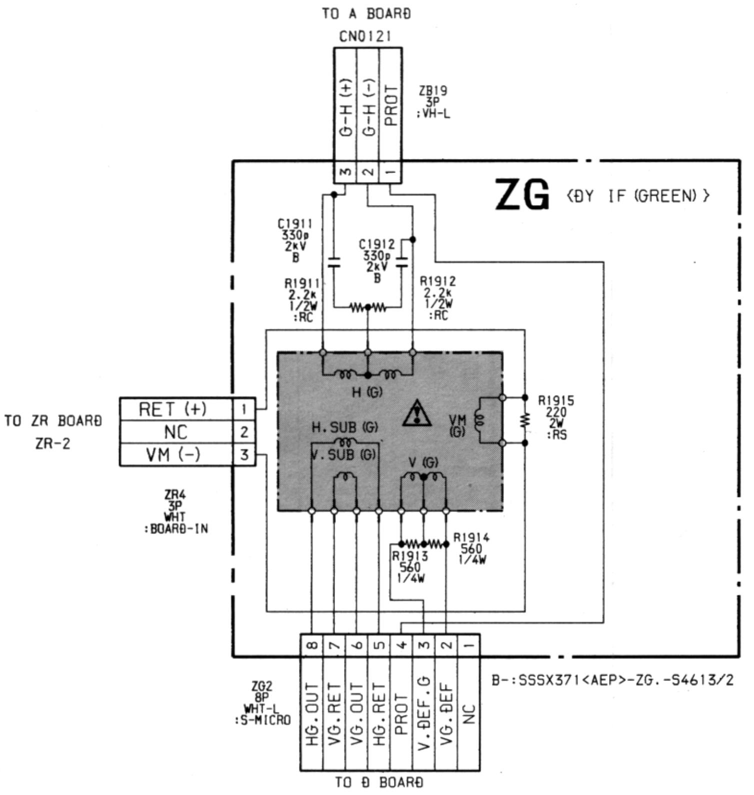
D BOARD IC902 CXA1268P

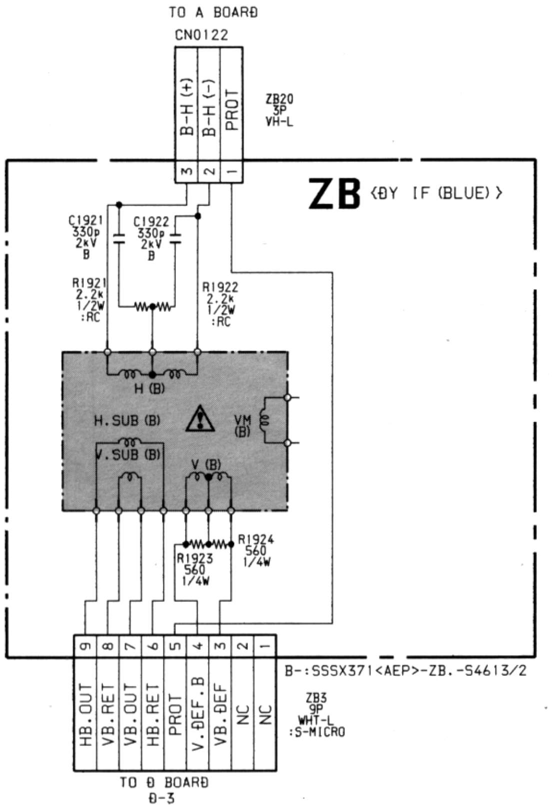


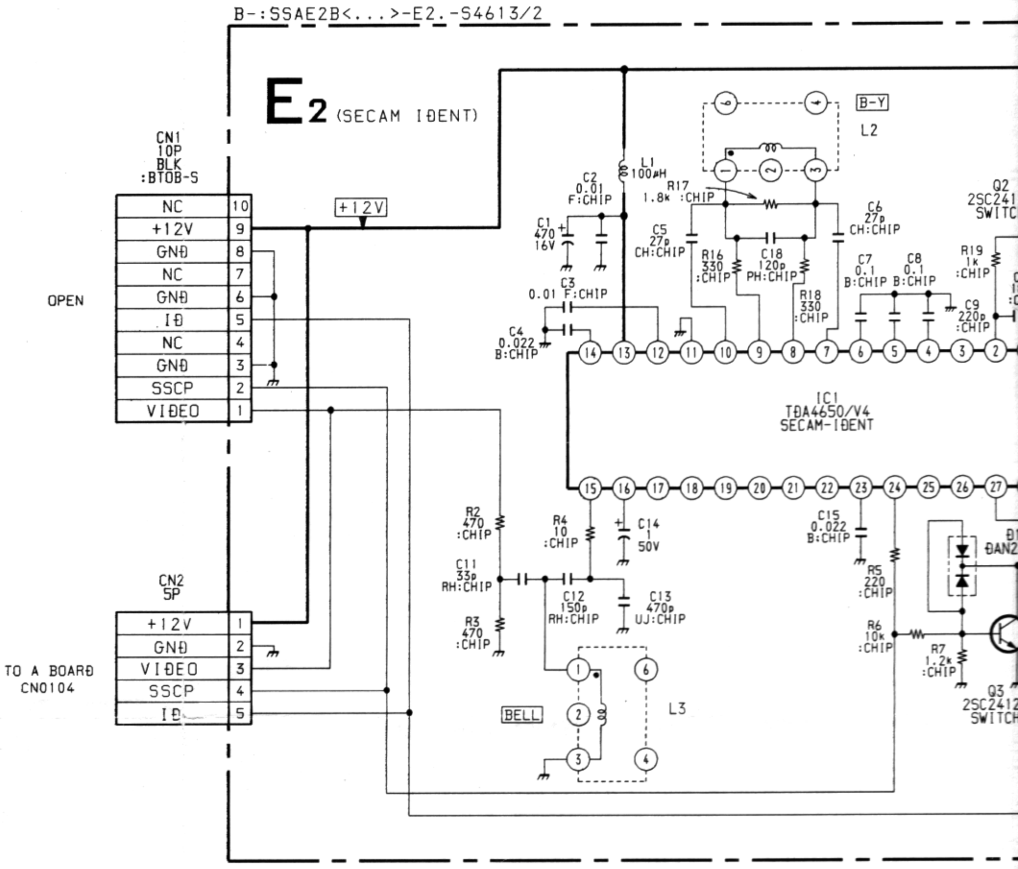
WAVEFORMS D BOARD

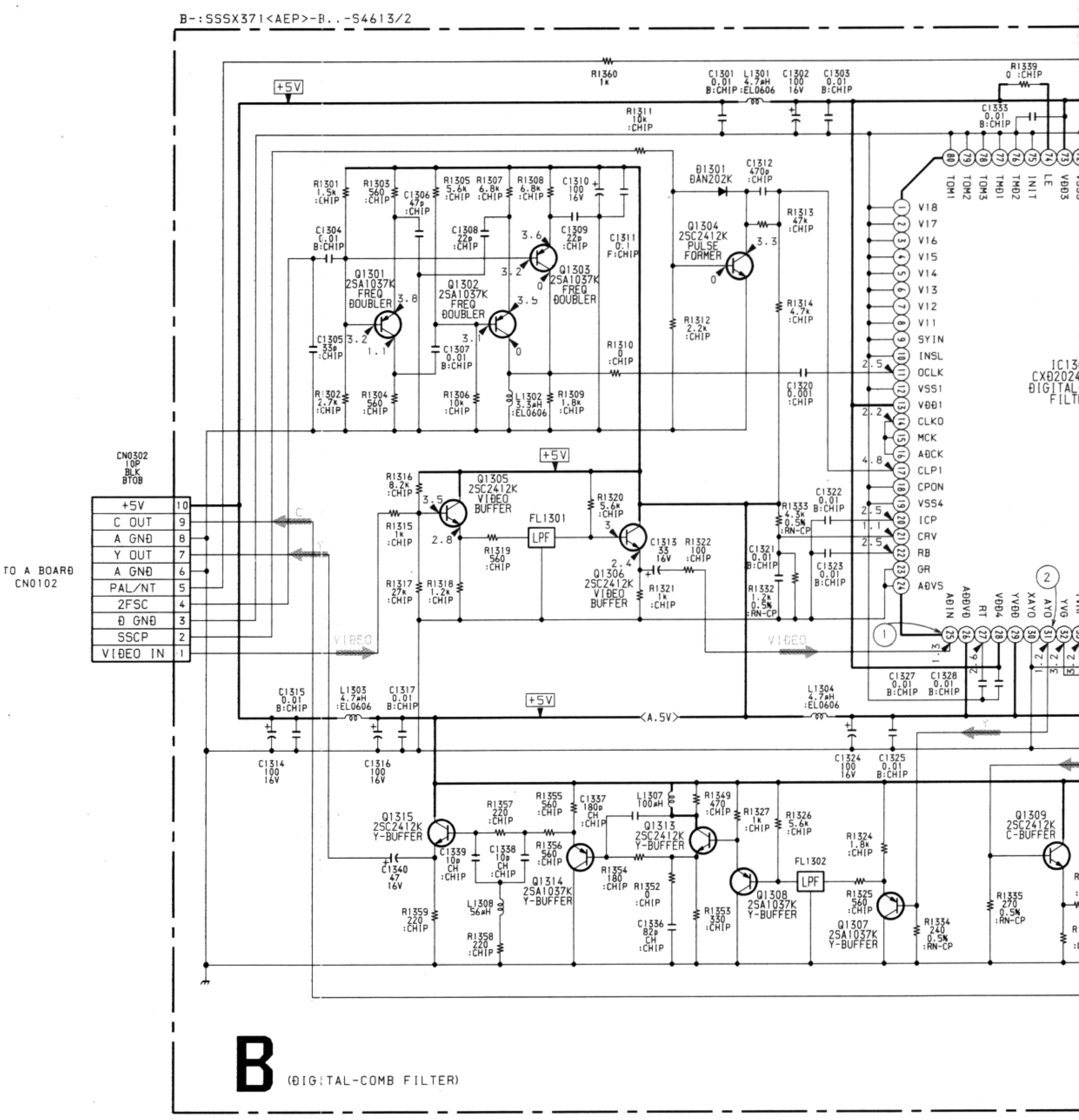


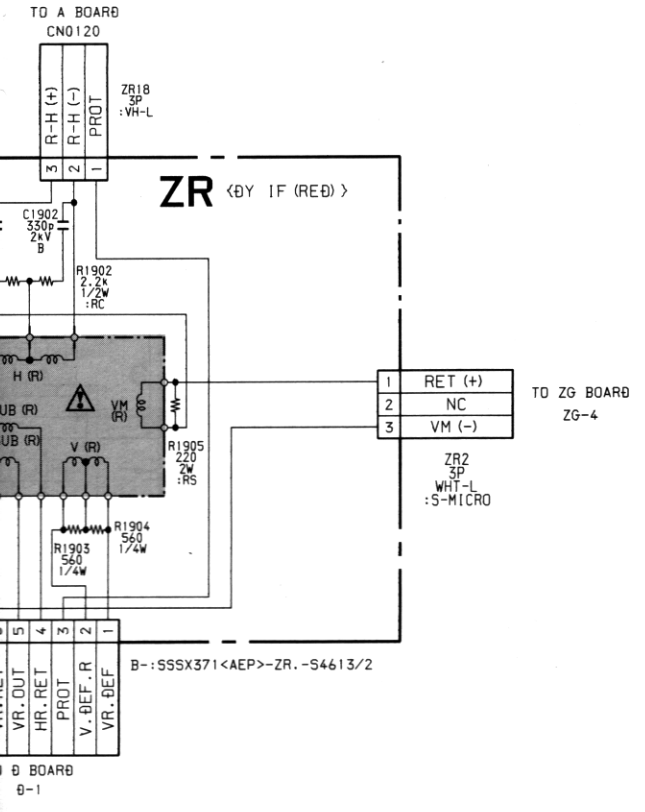

TO A BOARD
CN0120
R-H (+)
R-H (-)
PROT
ZR18
3P
:VH-L
ZR (DY IF (RED))
C1901
330p
2kV
B
C1902
330p
2kV
B
R1901
2.2k
1/2W
:RC
R1902
2.2k
1/2W
:RC
H (R)
H.SUB (R)
V.SUB (R)
VM (R)
V (R)
R1905
220
2W
:RS
R1904
560
1/4W
R1903
560
1/4W
TO VM BOARD
V-2
RET (-)
NC
VM (+)
ZR3
3P
WHT
BOARD-IN
RET (+)
NC
VM (-)
TO ZG BOARD
ZG-4
ZR2
3P
WHT-L
:S-MICRO
ZR1
7P
WHT-L
:S-MICRO
HR.OUT
VR.RET
VR.OUT
HR.RET
PROT
V.DEF.R
VR.DEF
TO D BOARD
D-1
B-:SSSX371<AEP>-ZR.-S4613/2

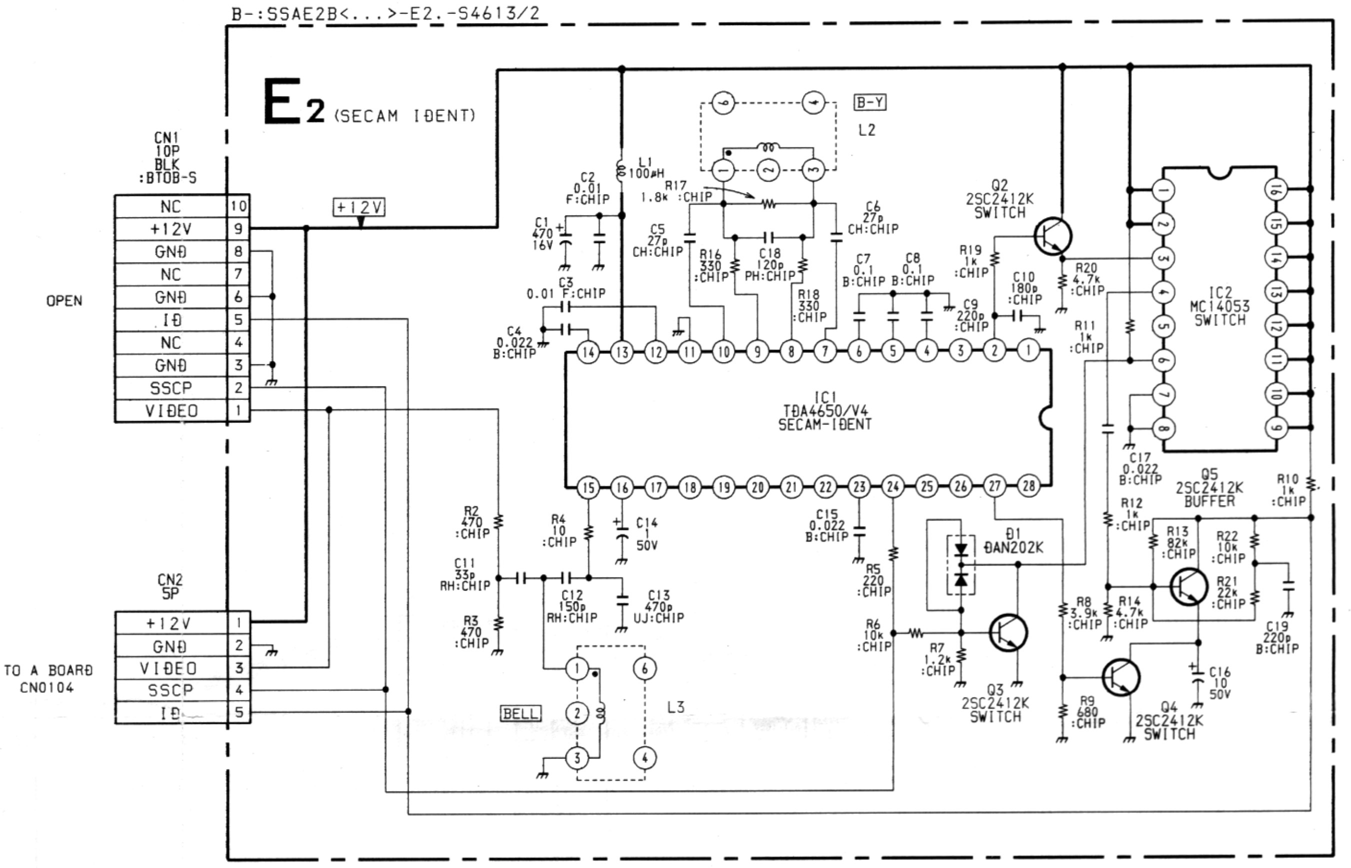

TO A BOARD
CN0121
G-H (+)
G-H (-)
PROT
ZB19
3P
:VH-L
ZG (DY IF (GREEN))
C1911
330p
2kV
B
C1912
330p
2kV
B
R1911
2.2k
1/2W
:RC
R1912
2.2k
1/2W
:RC
H (G)
H.SUB (G)
V.SUB (G)
VM (G)
V (G)
R1915
220
2W
:RS
R1914
560
1/4W
R1913
560
1/4W
TO ZR BOARD
ZR-2
RET (+)
NC
VM (-)
ZR4
3P
WHT
:BOARD-IN
ZG2
8P
WHT-L
:S-MICRO
HG.OUT
VG.RET
VG.OUT
HG.RET
PROT
V.DEF.G
VG.DEF
NC
TO D BOARD
D-2
B-:SSSX371<AEP>-ZG.-S4613/2

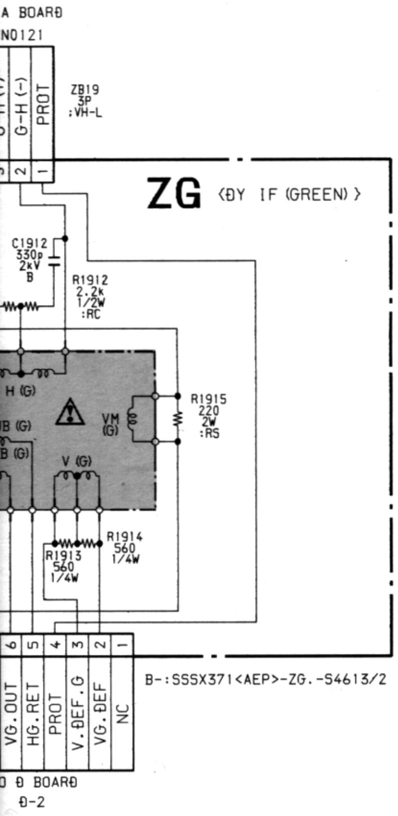

TO A BOARD
CN0122
B-H (+)
B-H (-)
PROT
ZB20
3P
VH-L
ZB (DY IF (BLUE))
C1921
330p
2kV
B
C1922
330p
2kV
B
R1921
2.2k
1/2W
:RC
R1922
2.2k
1/2W
:RC
H (B)
H.SUB (B)
V.SUB (B)
VM (B)
V (B)
R1924
560
1/4W
R1923
560
1/4W
HB.OUT
VB.RET
VB.OUT
HB.RET
PROT
V.DEF.B
VB.DEF
NC
NC
ZB3
9P
WHT-L
:S-MICRO
TO D BOARD
D-3
B-:SSSX371<AEP>-ZB.-S4613/2

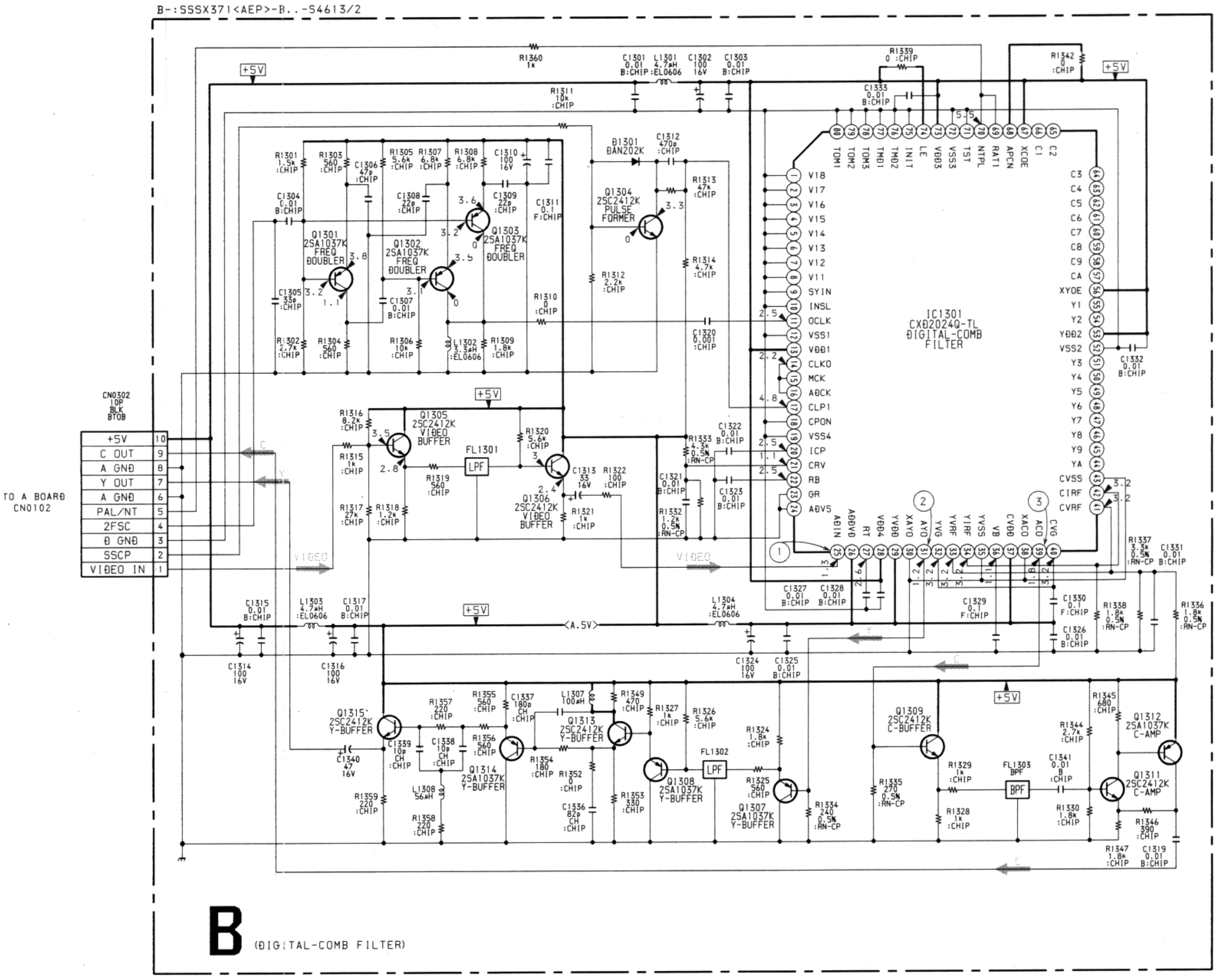

B-:SSAE2B<...>-E2.-S4613/2
E2 (SECAM IDENT)
CN1
10P
BLK
:BTOB-S
NC
+12V
GND
NC
GND
ID
NC
GND
SSCP
VIDEO
OPEN
+12V
CN2
5P
+12V
GND
VIDEO
SSCP
ID
TO A BOARD
CN0104
IC1
TDA4650/V4
SECAM-IDENT
L1
100μH
L2
L3
B-Y
BELL
R2
470
:CHIP
R3
470
:CHIP
R4
10
:CHIP
C14
1
50V
C11
33p
RH:CHIP
C12
150p
RH:CHIP
C13
470p
UJ:CHIP
C15
0.022
B:CHIP
R5
220
:CHIP
R6
10k
:CHIP
R7
1.2k
:CHIP
Q3
2SC2412
SWITCH
Q2
2SC241
SWITC
R19
1k
:CHIP
C9
220p
:CHIP
C1
470
16V
C2
0.01
F:CHIP
C3
0.01 F:CHIP
C4
0.022
B:CHIP
C5
27p
CH:CHIP
C6
27p
CH:CHIP
C7
0.1
B:CHIP
C8
0.1
B:CHIP
C18
120p
PH:CHIP
R16
330
:CHIP
R17
1.8k :CHIP
R18
330
:CHIP

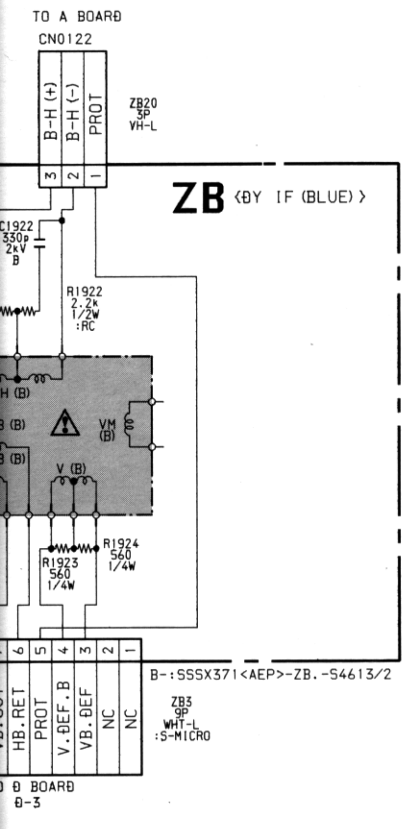

B-:SSSX371<AEP>-B..-S4613/2
B (DIGITAL-COMB FILTER)
CN0302
10P
BLK
BTOB
+5V
C OUT
A GND
Y OUT
A GND
PAL/NT
2FSC
D GND
SSCP
VIDEO IN
TO A BOARD
CN0102
+5V
Q1301
2SA1037K
FREQ
DOUBLER
Q1302
2SA1037K
FREQ
DOUBLER
Q1303
2SA1037K
FREQ
DOUBLER
Q1304
2SC2412K
PULSE
FORMER
D1301
DAN202K
Q1305
2SC2412K
VIDEO
BUFFER
Q1306
2SC2412K
VIDEO
BUFFER
FL1301
LPF
FL1302
LPF
Q1315
2SC2412K
Y-BUFFER
Q1314
2SA1037K
Y-BUFFER
Q1313
2SC2412K
Y-BUFFER
Q1308
2SA1037K
Y-BUFFER
Q1307
2SA1037K
Y-BUFFER
Q1309
2SC2412K
C-BUFFER
IC13
CXD2024
DIGITAL
FILTE
VIDEO
<A.5V>
L1303
4.7μH
:EL0606
L1304
4.7μH
:EL0606
L1301
4.7μH
:EL0606
L1302
3.3μH
:EL0606
L1307
100μH
L1308
56μH

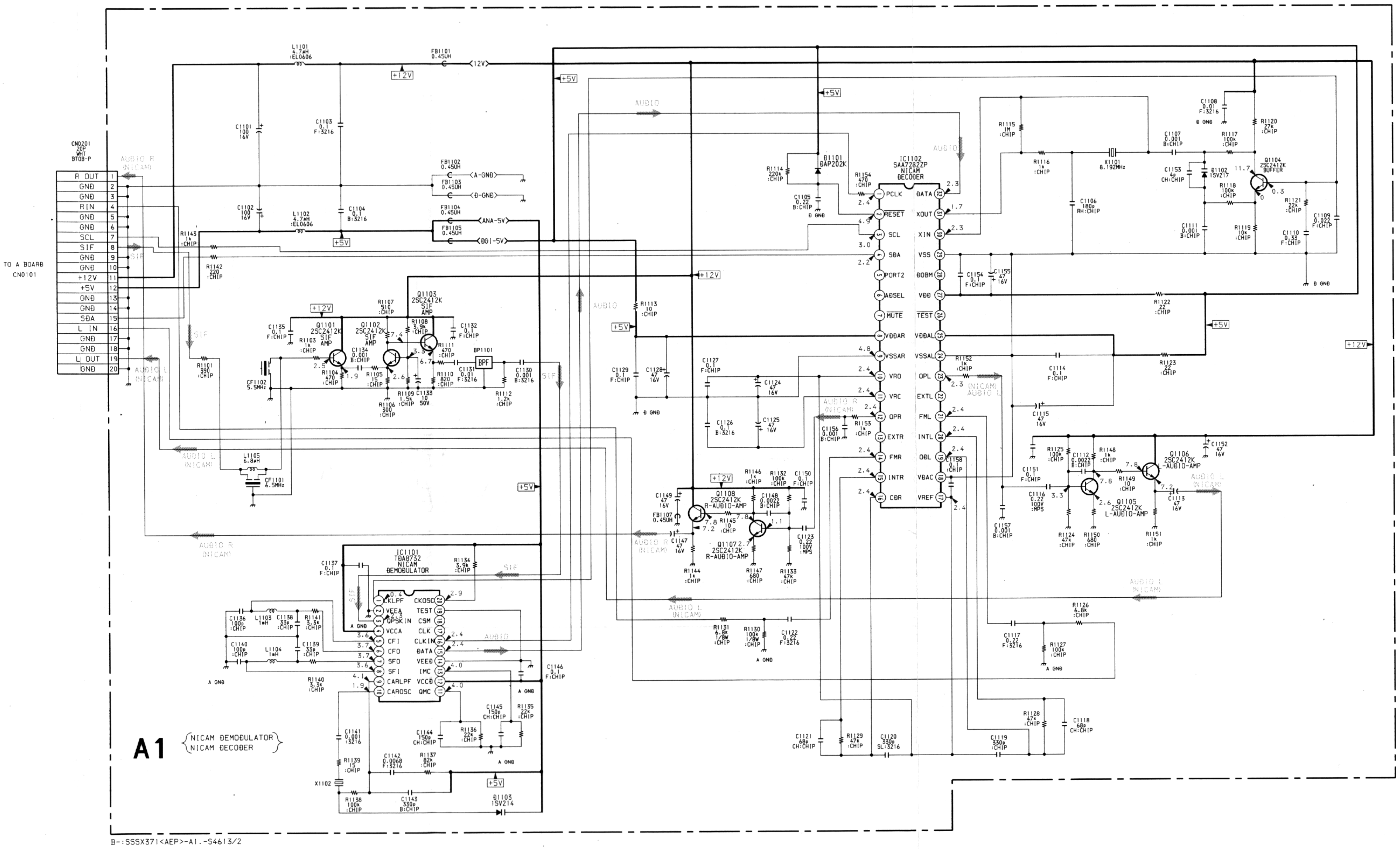

TO A BOARD
CN0120
ZR18
3P
:VH-L
R-H(+)
R-H(-)
PROT
ZR (DY IF (RED))
C1902
330p
2kV
B
R1902
2.2k
1/2W
:RC
H (R)
VM (R)
V (R)
R1905
220
2W
:RS
R1904
560
1/4W
R1903
560
1/4W
RET (+)
NC
VM (-)
TO ZG BOARD
ZG-4
ZR2
3P
WHT-L
:S-MICRO
VR.OUT
VR.RET
HR.RET
PROT
V.DEF.R
VR.DEF
B-:SSSX371<AEP>-ZR.-S4613/2
D BOARD
D-1


B-:SSAE2B<...>-E2.-S4613/2
E2 (SECAM IDENT)
CN1
10P
BLK
:BTOB-S
NC
+12V
GND
NC
GND
ID
NC
GND
SSCP
VIDEO
OPEN
+12V
CN2
5P
+12V
GND
VIDEO
SSCP
ID
TO A BOARD
CN0104
IC1
TDA4650/V4
SECAM-IDENT
IC2
MC14053
SWITCH
Q2
2SC2412K
SWITCH
Q3
2SC2412K
SWITCH
Q4
2SC2412K
SWITCH
Q5
2SC2412K
BUFFER
D1
DAN202K
L1
100μH
L2
L3
B-Y
BELL


A BOARD
CN0121
ZB19
3P
:VH-L
PROT
ZG (DY IF (GREEN))
C1912
330p
2kV
B
R1912
2.2k
1/2W
:RC
H (G)
VM (G)
V (G)
R1915
220
2W
:RS
R1913
560
1/4W
R1914
560
1/4W
VG.OUT
HG.RET
PROT
V.DEF.G
VG.DEF
NC
B-:SSSX371<AEP>-ZG.-S4613/2
D BOARD
D-2


B-:SSSX371<AEP>-B..-S4613/2
CN0302
10P
BLK
BTOB
+5V
C OUT
A GND
Y OUT
A GND
PAL/NT
2FSC
D GND
SSCP
VIDEO IN
TO A BOARD
CN0102
Q1301
2SA1037K
FREQ
DOUBLER
Q1302
2SA1037K
FREQ
DOUBLER
Q1303
2SA1037K
FREQ
DOUBLER
Q1304
2SC2412K
PULSE
FORMER
D1301
DAN202K
Q1305
2SC2412K
VIDEO
BUFFER
Q1306
2SC2412K
VIDEO
BUFFER
FL1301
LPF
IC1301
CXD2024Q-TL
DIGITAL-COMB
FILTER
Q1315
2SC2412K
Y-BUFFER
Q1314
2SA1037K
Y-BUFFER
Q1313
2SC2412K
Y-BUFFER
Q1308
2SA1037K
Y-BUFFER
Q1307
2SA1037K
Y-BUFFER
FL1302
LPF
Q1309
2SC2412K
C-BUFFER
FL1303
BPF
Q1312
2SA1037K
C-AMP
Q1311
2SC2412K
C-AMP
+5V
A.5V
VIDEO
B (DIGITAL-COMB FILTER)


TO A BOARD
CN0122
ZB20
3P
VH-L
B-H(+)
B-H(-)
PROT
ZB (DY IF (BLUE))
C1922
330p
2kV
B
R1922
2.2k
1/2W
:RC
VM (B)
V (B)
R1924
560
1/4W
R1923
560
1/4W
HB.RET
PROT
V.DEF.B
VB.DEF
NC
NC
B-:SSSX371<AEP>-ZB.-S4613/2
ZB3
9P
WHT-L
:S-MICRO
D BOARD
D-3

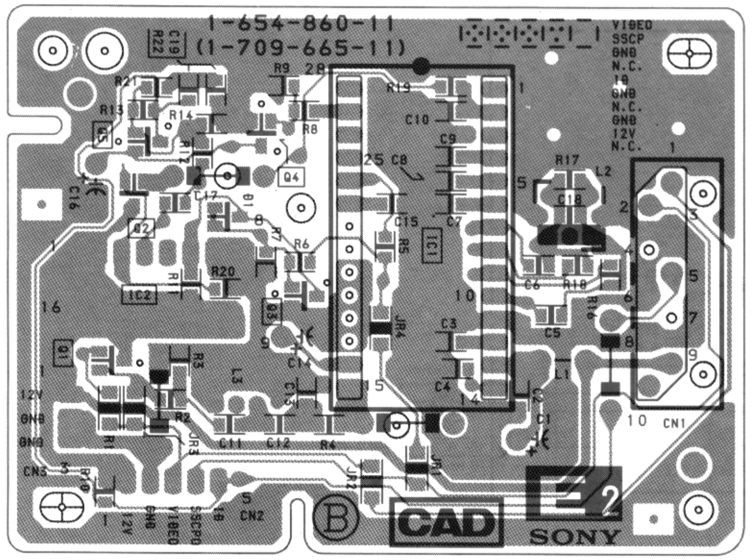


A1 NICAM DEMODULATOR
NICAM DECODER

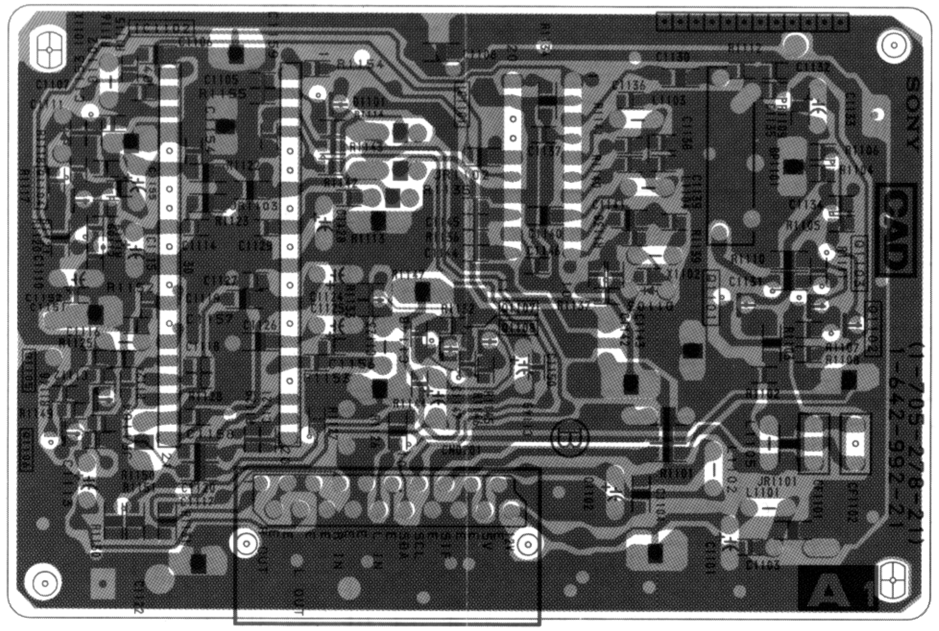
B-:SSSX371<AEP>-A1.-S4613/2

E2 [SECAM IDENT]   **B** [DIGITAL-COMB FILTER]   **A1** [NICAM DEMODULATOR NICAM DECODER]   **ZR** [DY IF (RED)]   **ZG** [DY IF (GREEN)]   **ZB** [DY IF (BLUE)]

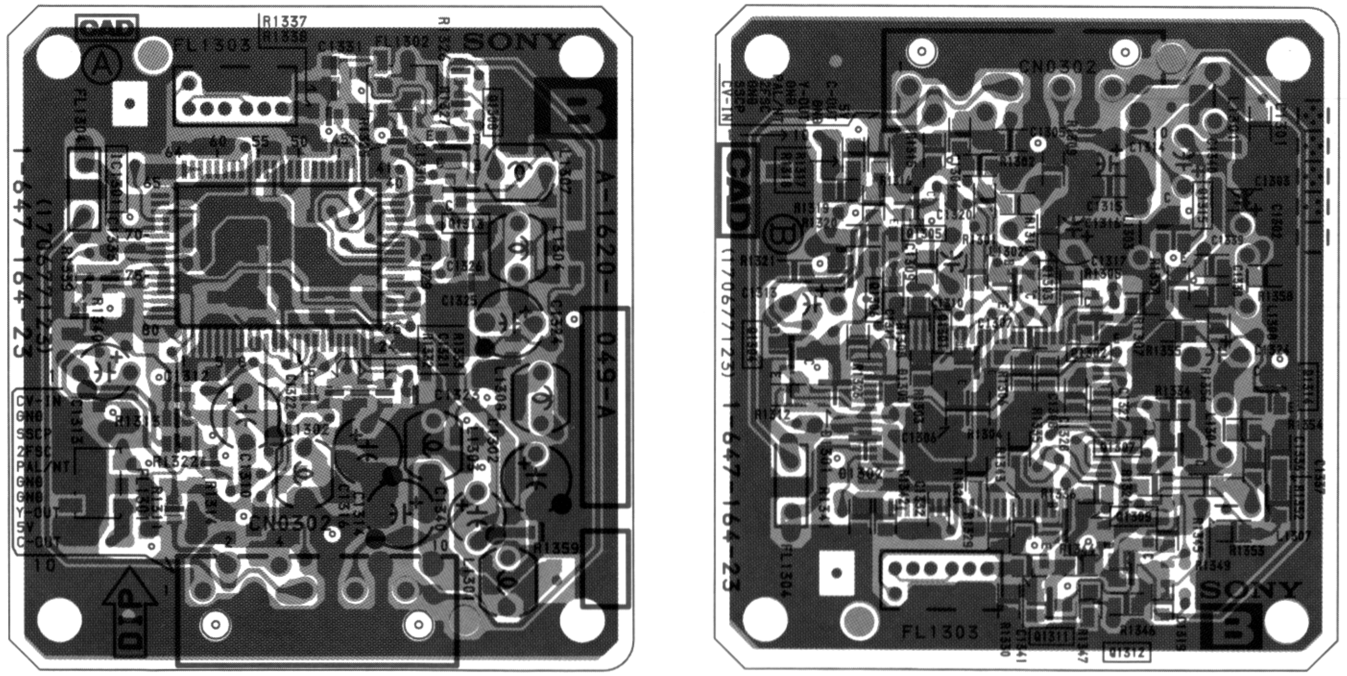
— E2 BOARD —



— A1 BOARD —

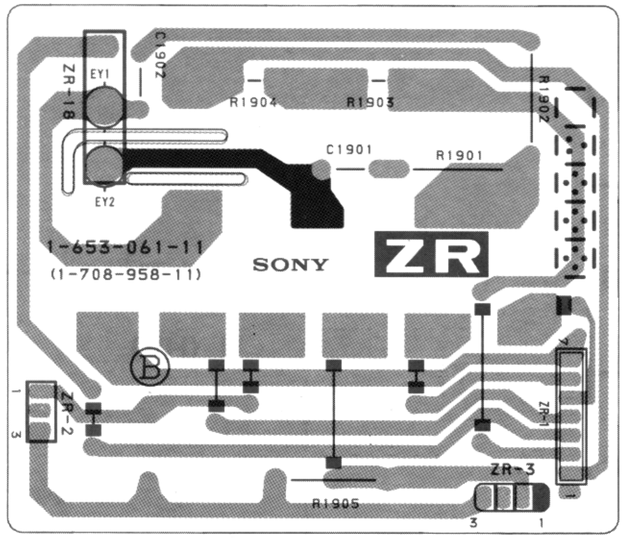


— B BOARD —

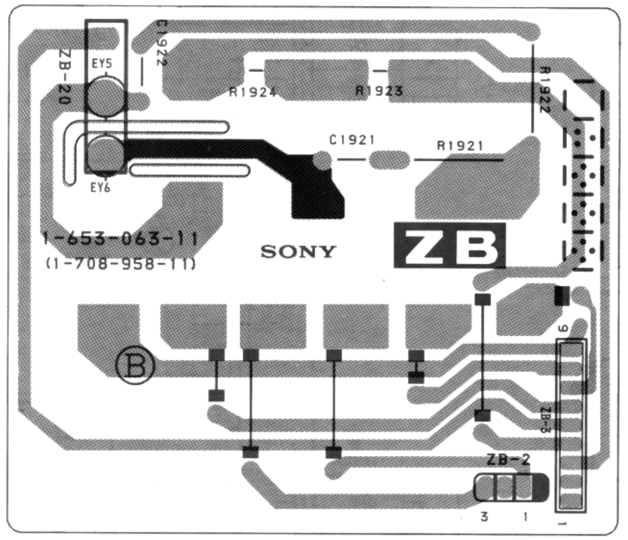


- ▨ : Pattern from the side which enables seeing.
- ▩ : Pattern of the rear side.

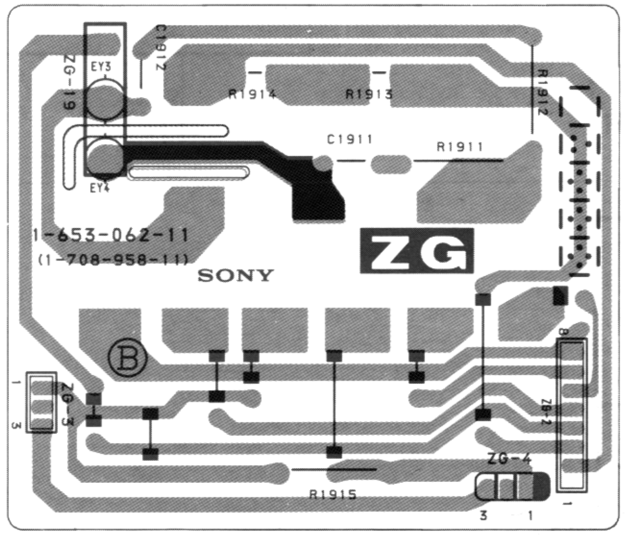
— ZR BOARD —

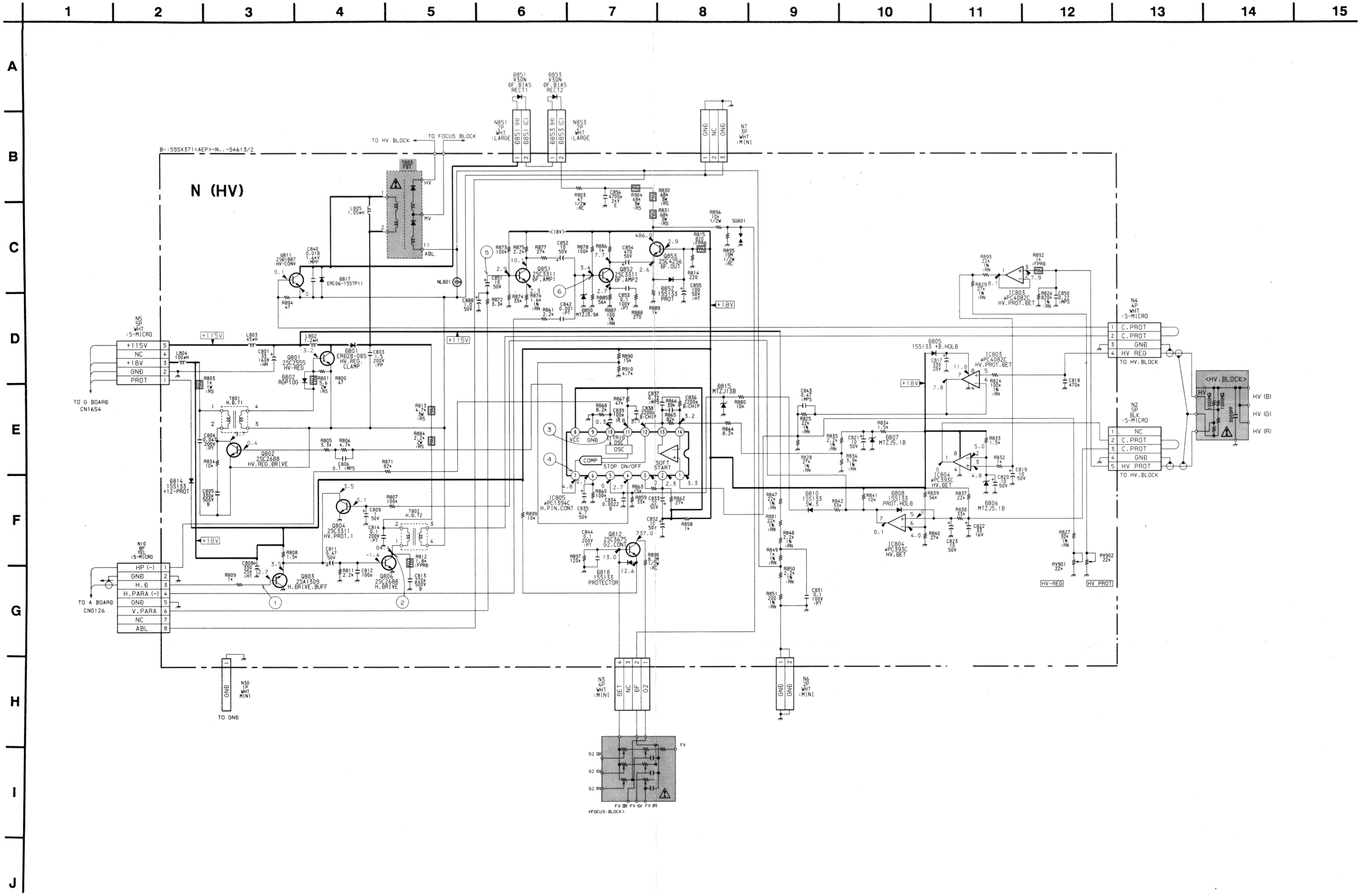


— ZB BOARD —

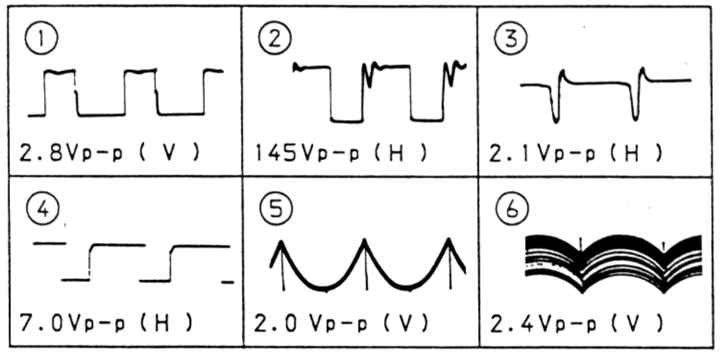


— ZG BOARD —



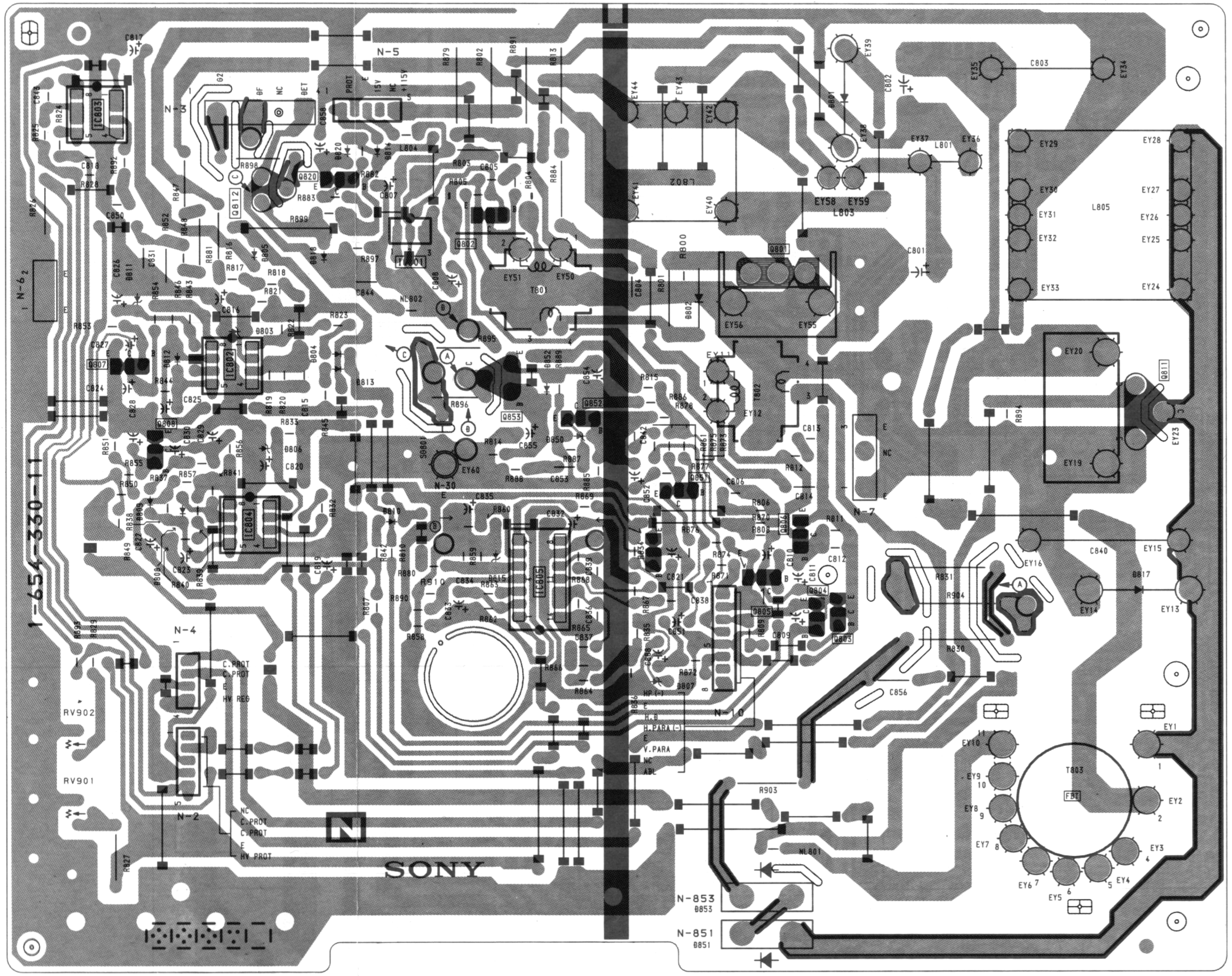

N (HV)
B-:SSSX371<AEP>-N..-S4613/2
TO HV BLOCK
TO FOCUS BLOCK
T803 FBT
HV
MV
ABL
D851 V30N DF.BIAS RECT1
D853 V30N DF.BIAS RECT2
N851 2P WHT :LARGE
N853 2P WHT :LARGE
N7 3P WHT :MINI
GND
NC
GND
Q811 2SD1887 HV-CONV
D817 ERC06-15STP11
L805 1.05mH
NL801
Q851 2SC3311 DF.AMP1
Q852 2SC3311 DF.AMP2
Q853 2SC4256 DF.OUT
D852 1SS133 PROT
D850 MTZJ3.9A
SG801
N5 5P WHT :S-MICRO
+115V
NC
+18V
GND
PROT
TO G BOARD CN1654
L803 45μH
L804 100μH
Q801 2SC2555 HV-REG
D801 ERD28-08S HV.REG CLAMP
D802 RGP10G
T801 H.D.T1
Q802 2SC2688 HV.REG.DRIVE
D814 1SS133 +12-PROT
IC805 μPC1394C H.PIN.CONT
VCC
GND
TRIG OSC
OSC
COMP
STOP ON/OFF
SOFT START
D815 MTZJ13B
Q804 2SC3311 HV.PROT.1
T802 H.D.T2
Q803 2SA1309 H.DRIVE.BUFF
Q806 2SC2688 H.DRIVE
Q812 2SC3675 G2.CONT
D818 1SS133 PROTECTOR
N10 8P YEL :S-MICRO
HP (-)
GND
H.D
H.PARA (-)
GND
V.PARA
NC
ABL
TO A BOARD CN0126
N30 1P WHT MINI
TO GND
N3 4P WHT :MINI
DET
NC
DF
G2
N6 2P WHT :MINI
GND
GND
FV
G2 (B)
G2 (G)
G2 (R)
FV (B) FV (G) FV (R)
<FOCUS-BLOCK>
IC803 μPC4082C HV.PROT.DET
D805 1SS133 +B.HOLD
IC803 μPC4082C HV.PROT.DET
IC804 μPC393C HV.DET
D807 MTZJ5.1B
D808 1SS133 PROT.HOLD
D810 1SS133 SW.3
D806 MTZJ5.1B
IC804 μPC393C HV.DET
RV901 22k
RV902 22k
HV-REG
HV PROT
N4 4P WHT :S-MICRO
C.PROT
C.PROT
GND
HV REG
TO HV.BLOCK
N2 5P BLK :S-MICRO
NC
C.PROT
C.PROT
GND
HV PROT
TO HV.BLOCK
<HV.BLOCK>
HV (B)
HV (G)
HV (R)
+18V
+115V
<18V>
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J

WAVEFORMS N BOARD



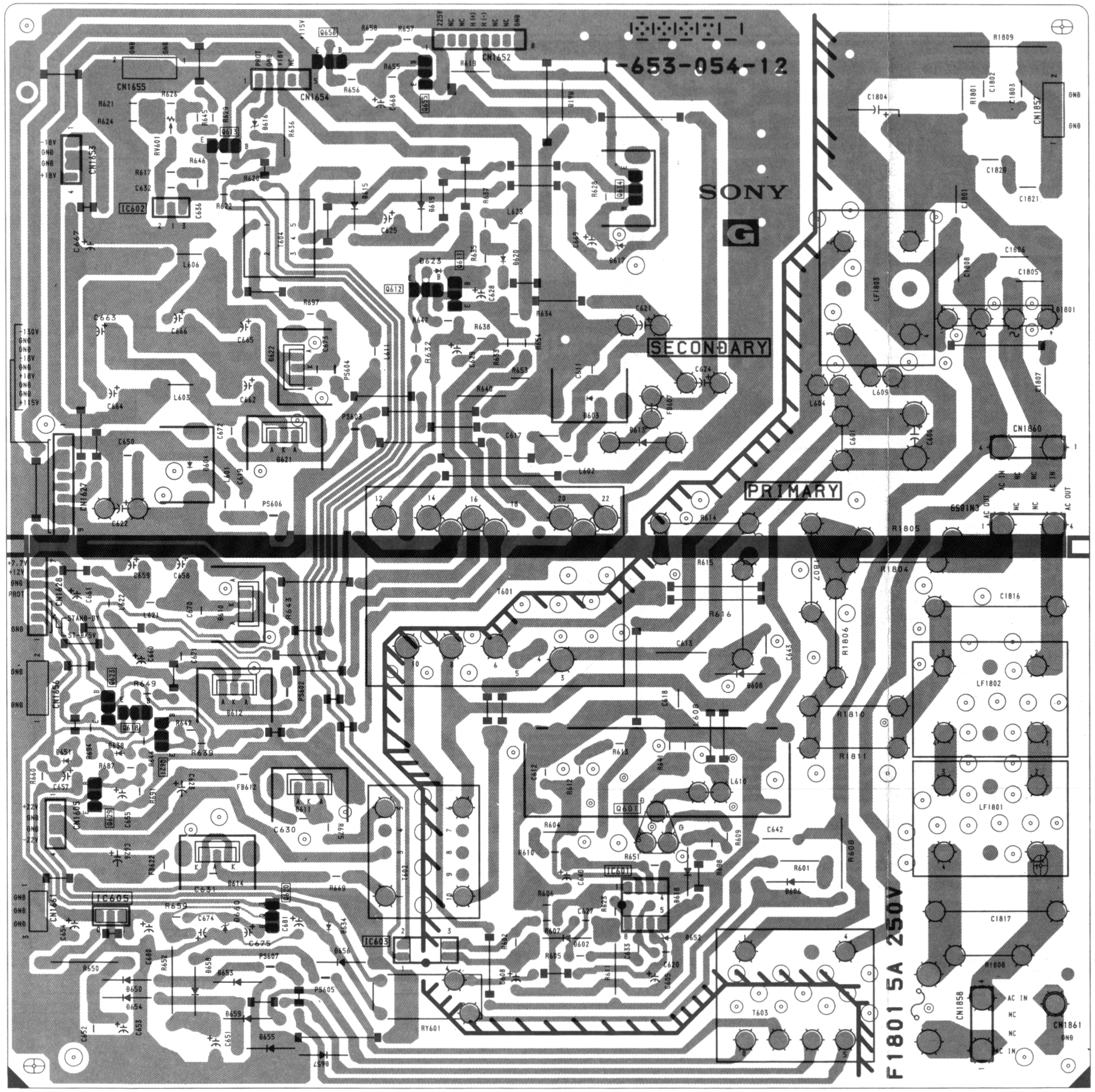
N [HV]

— N BOARD —

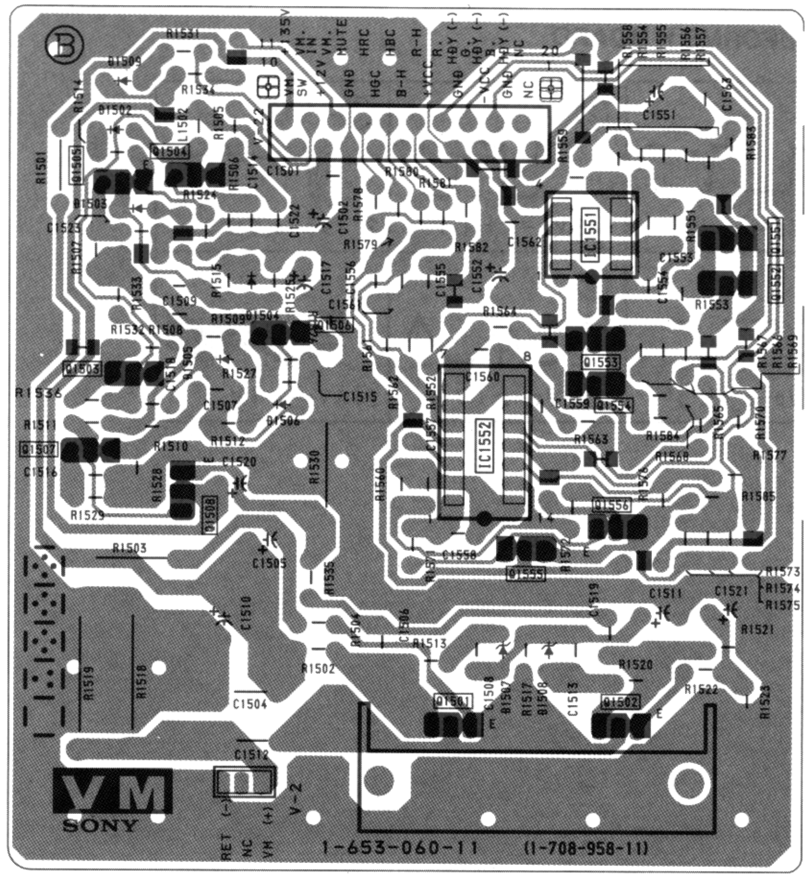


G [POWER SUPPLY] **VM** [VM AMP] **Ds** [H/V SIN, WAVE GEN]

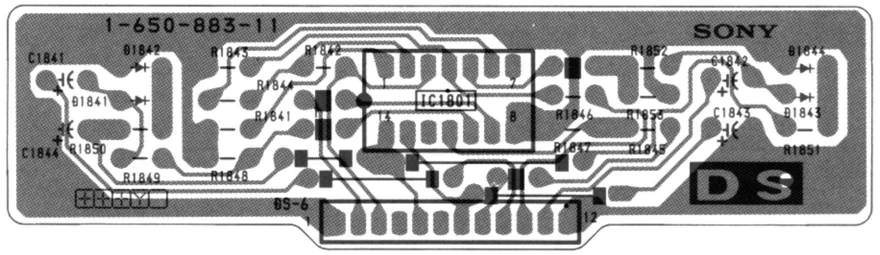
— G BOARD —

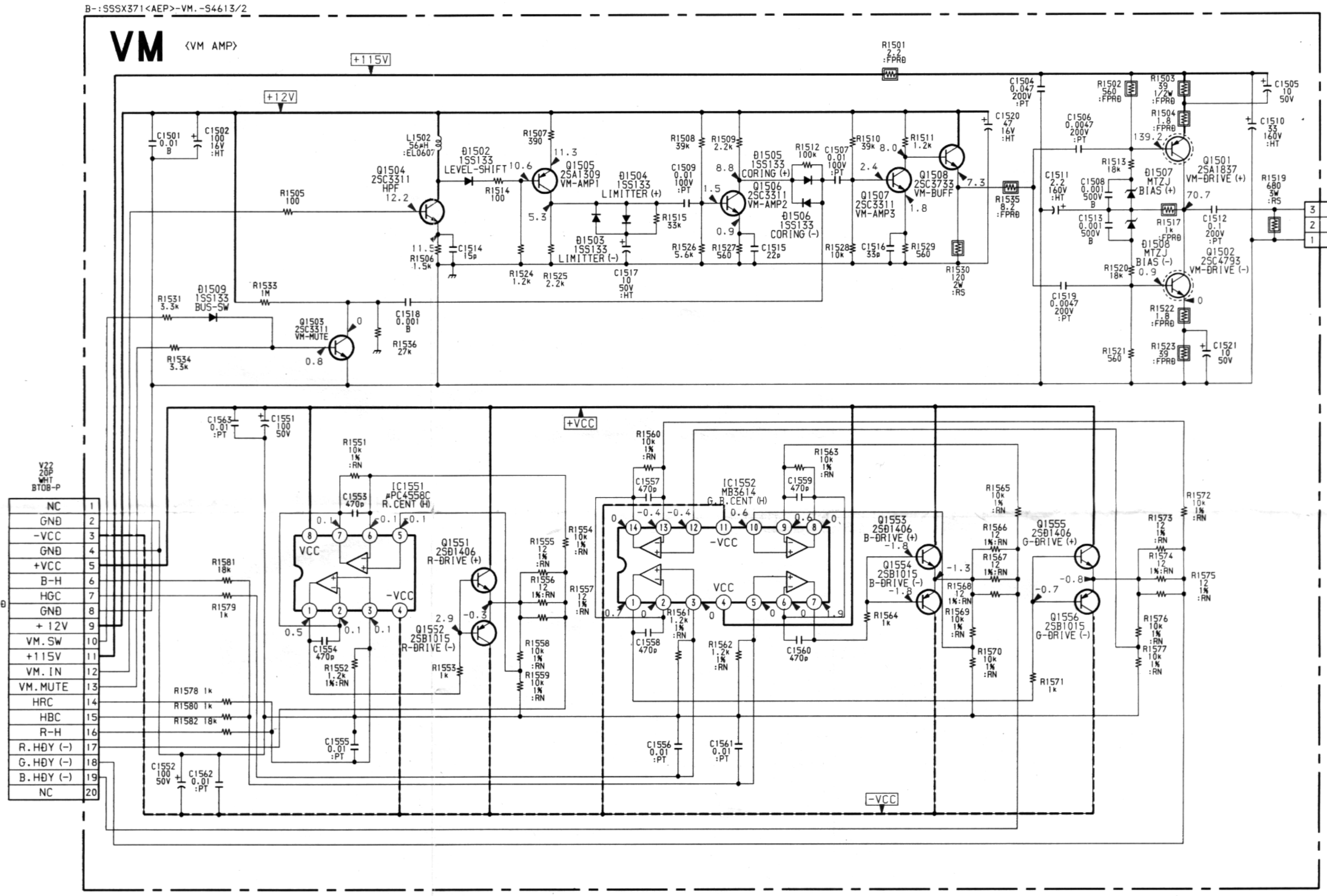


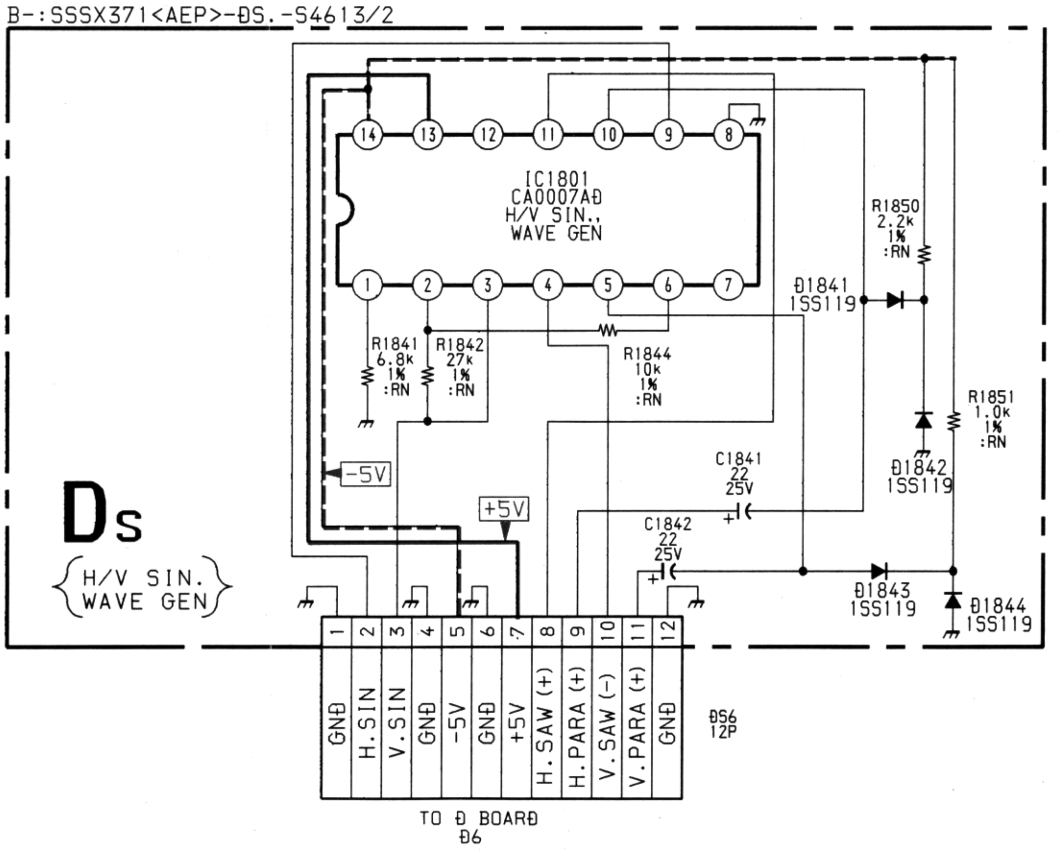
— VM BOARD —



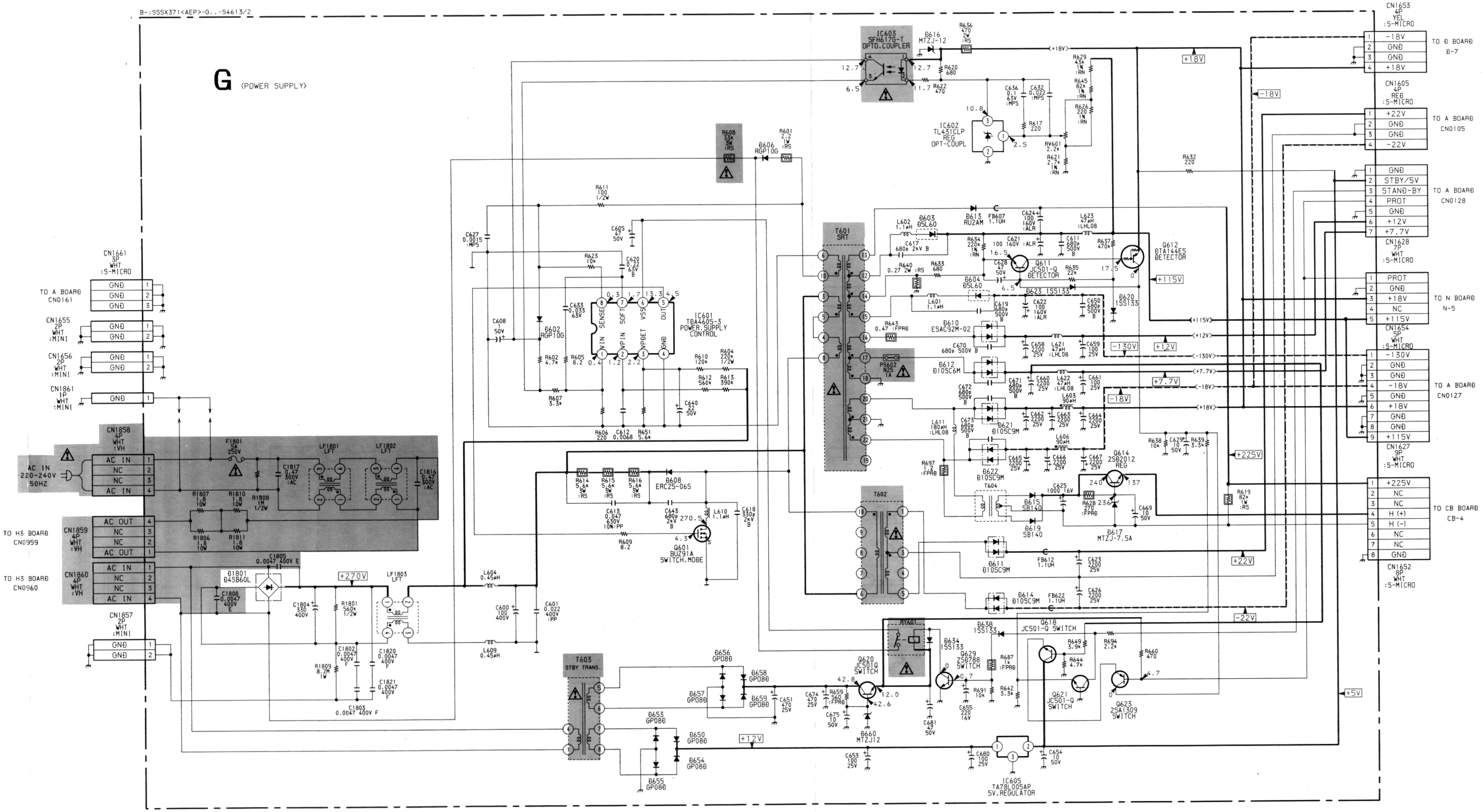
— DS BOARD —

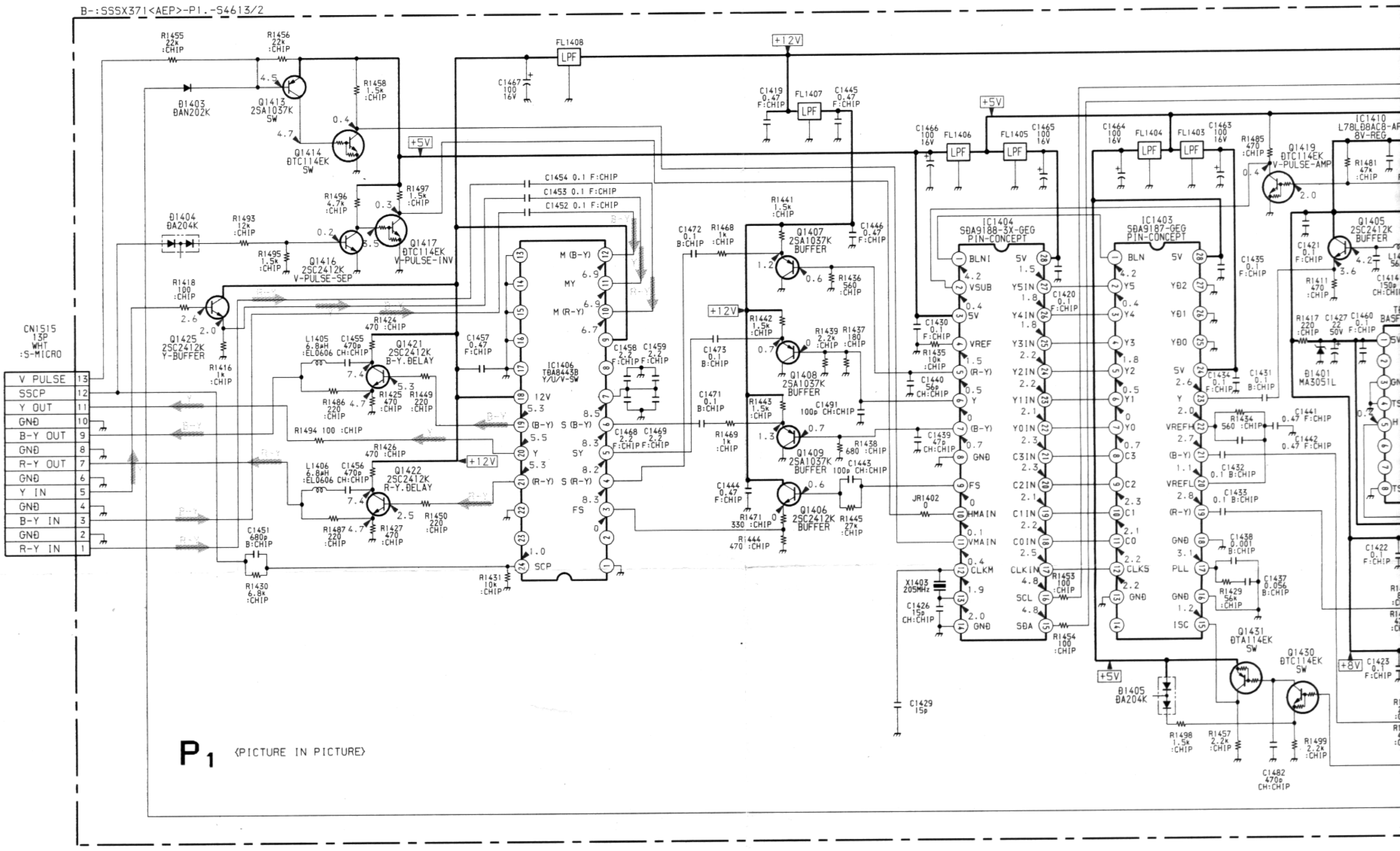


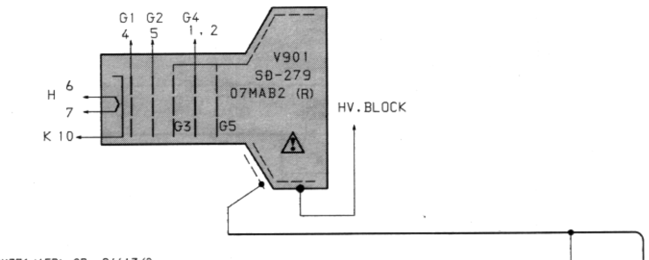

B-:SSSX371<AEP>-VM.-S4613/2
VM
<VM AMP>
+115V
+12V
+VCC
-VCC
Q1504 2SC3311 HPF
Q1505 2SA1309 VM-AMP1
Q1506 2SC3311 VM-AMP2
Q1507 2SC3311 VM-AMP3
Q1508 2SC3733 VM-BUFF
Q1501 2SA1837 VM-DRIVE (+)
Q1502 2SC4793 VM-DRIVE (-)
Q1503 2SC3311 VM-MUTE
D1502 1SS133 LEVEL-SHIFT
D1503 1SS133 LIMITTER (-)
D1504 1SS133 LIMITTER (+)
D1505 1SS133 CORING (+)
D1506 1SS133 CORING (-)
D1507 MTZJ BIAS (+)
D1508 MTZJ BIAS (-)
D1509 1SS133 BUS-SW
L1502 56μH :EL0607
IC1551 μPC4558C R.CENT (H)
IC1552 MB3614 G.B.CENT (H)
Q1551 2SB1406 R-DRIVE (+)
Q1552 2SB1015 R-DRIVE (-)
Q1553 2SB1406 B-DRIVE (+)
Q1554 2SB1015 B-DRIVE (-)
Q1555 2SB1406 G-DRIVE (+)
Q1556 2SB1015 G-DRIVE (-)
V22 20P WHT BTOB-P
TO A BOARD CN0103
1 NC
2 GND
3 -VCC
4 GND
5 +VCC
6 B-H
7 HGC
8 GND
9 +12V
10 VM.SW
11 +115V
12 VM.IN
13 VM.MUTE
14 HRC
15 HBC
16 R-H
17 R.HDY (-)
18 G.HDY (-)
19 B.HDY (-)
20 NC
3 VM (+)
2 NC
1 RET (-)
TO ZR BOARD ZR-3
V2 3P REB-L :S-MICRO

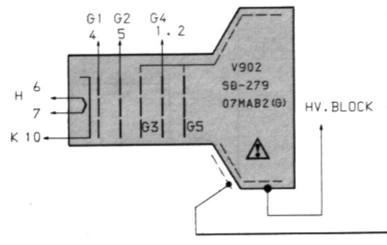

B-:SSSX371<AEP>-DS.-S4613/2
IC1801 CA0007AD H/V SIN., WAVE GEN
R1841 6.8k 1% :RN
R1842 27k 1% :RN
R1844 10k 1% :RN
R1850 2.2k 1% :RN
R1851 1.0k 1% :RN
D1841 1SS119
D1842 1SS119
D1843 1SS119
D1844 1SS119
C1841 22 25V
C1842 22 25V
-5V
+5V
Ds
H/V SIN. WAVE GEN
1 GND
2 H.SIN
3 V.SIN
4 GND
5 -5V
6 GND
7 +5V
8 H.SAW (+)
9 H.PARA (+)
10 V.SAW (-)
11 V.PARA (+)
12 GND
DS6 12P
TO D BOARD D6

G (POWER SUPPLY)

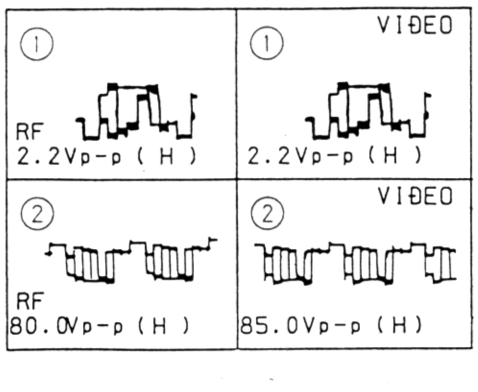




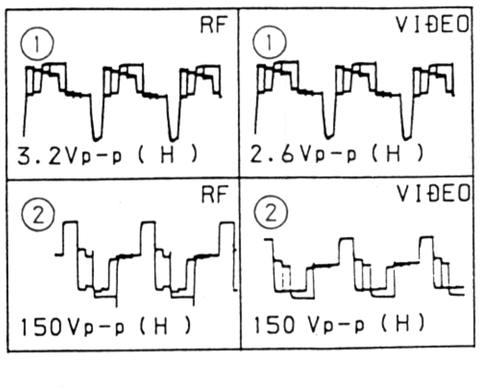




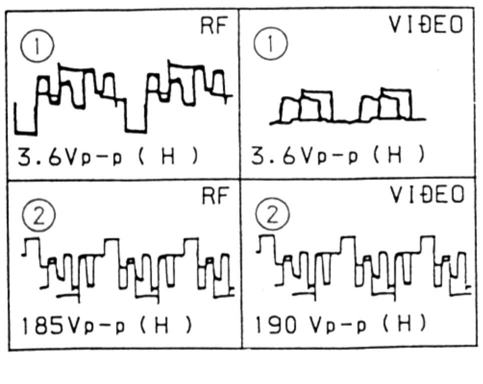
CR BOARD WAVEFORMS

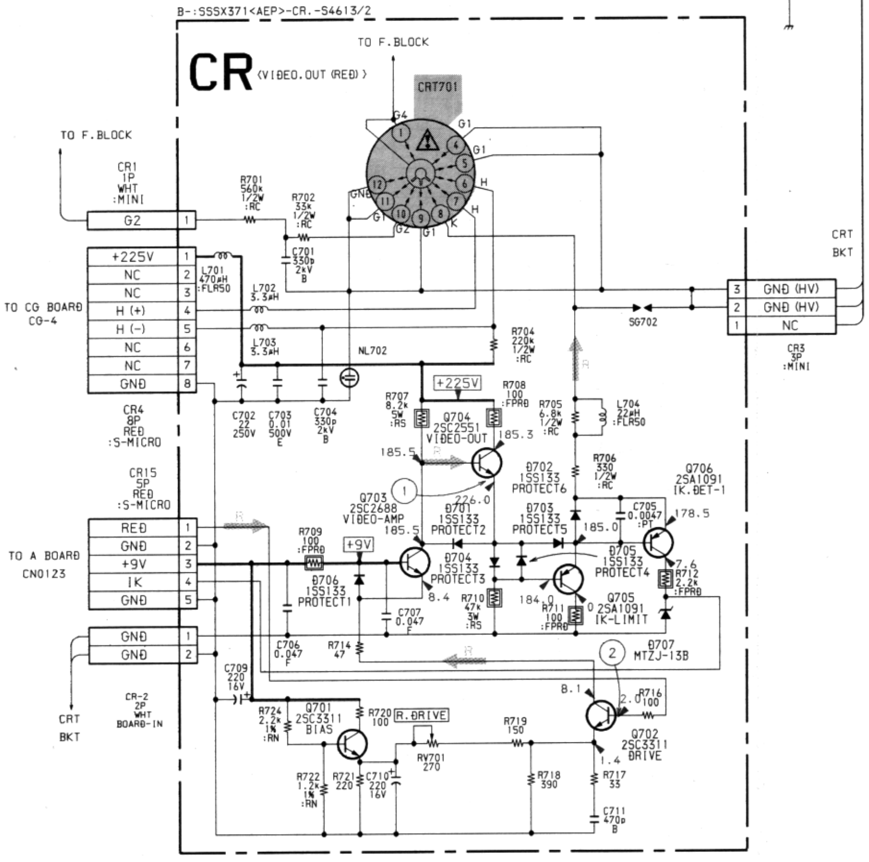


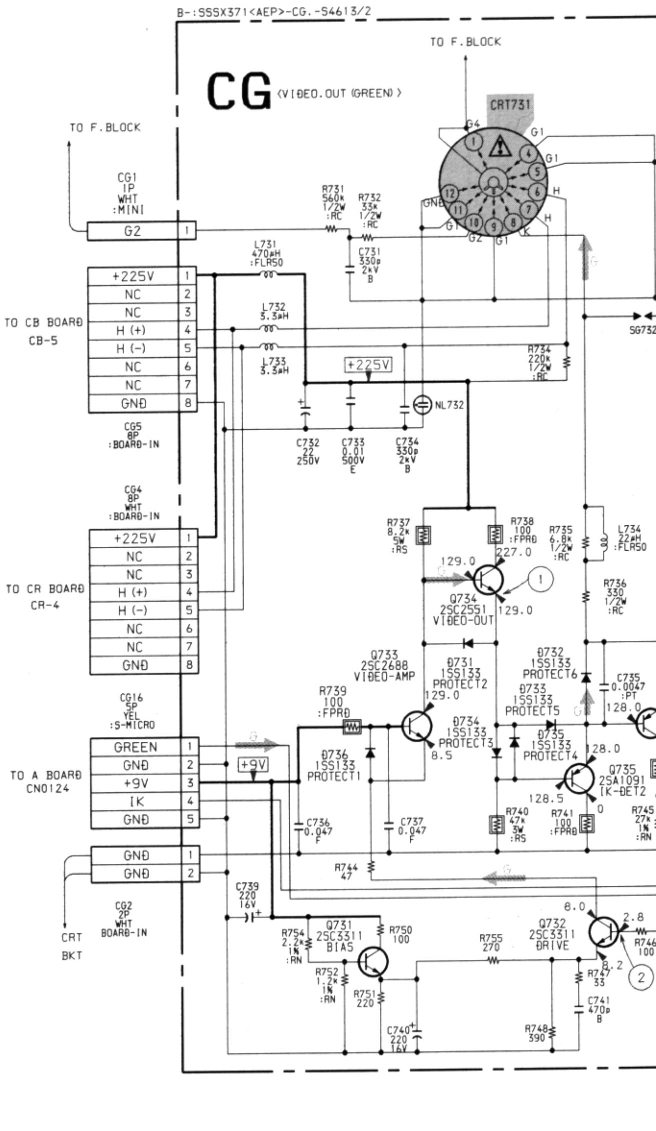
CG BOARD WAVEFORMS

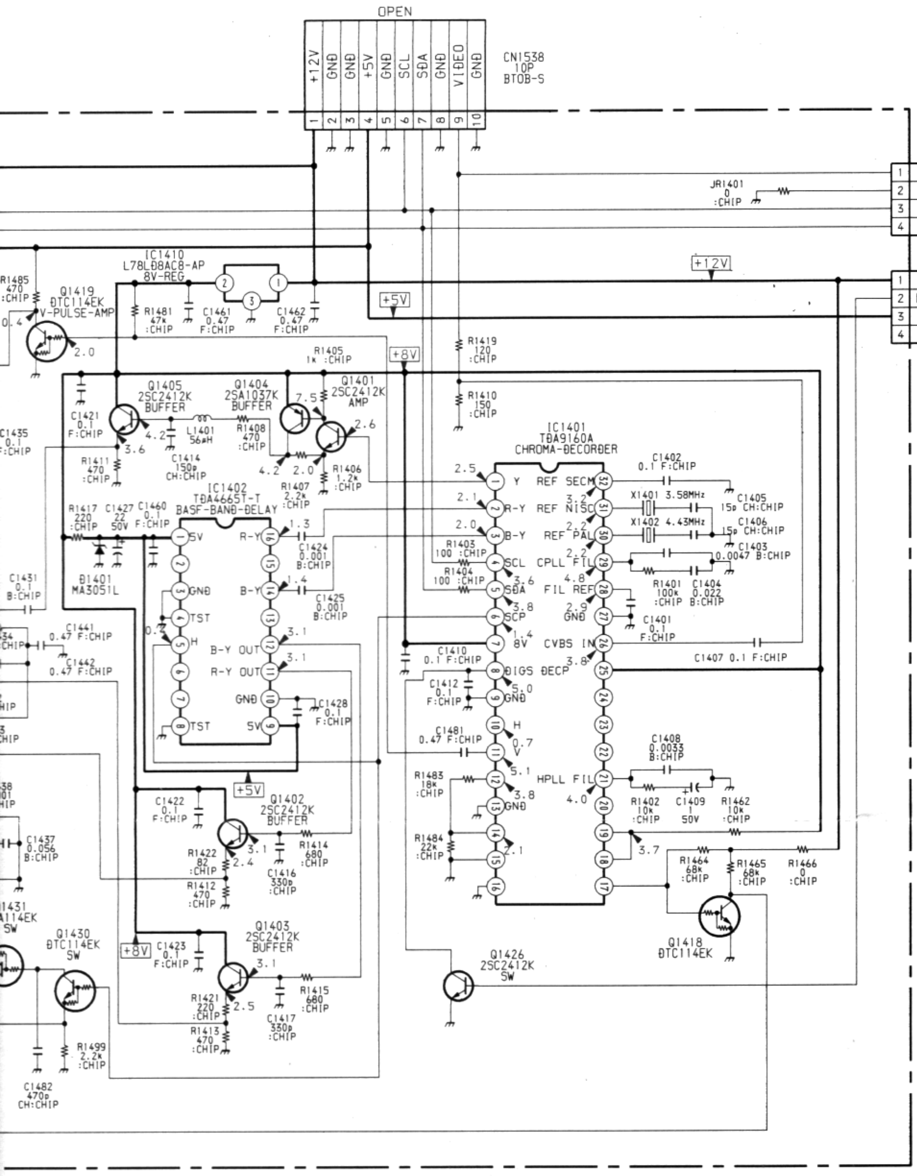


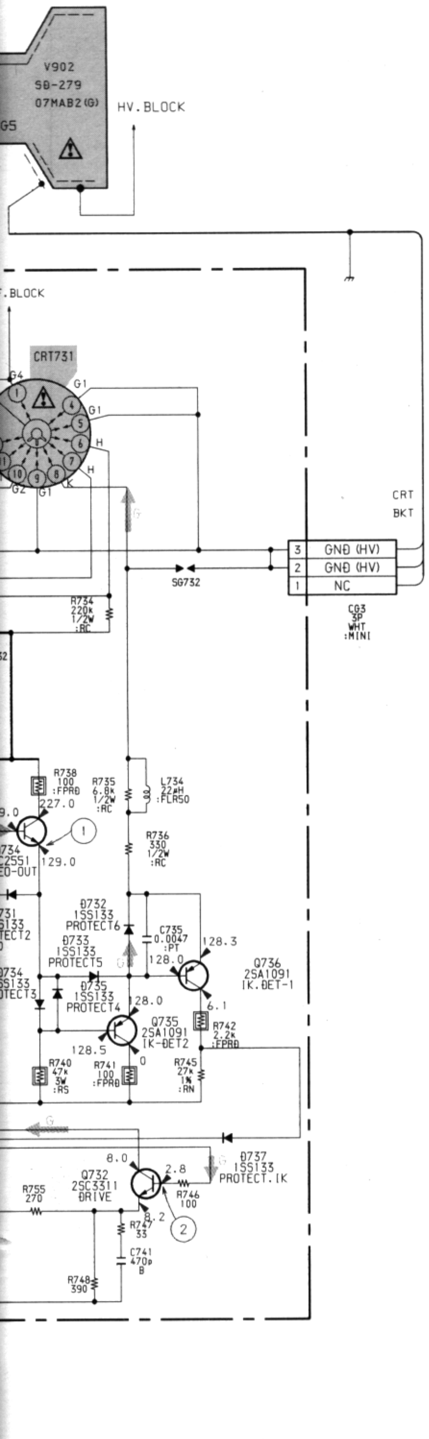
CB BOARD WAVEFORMS

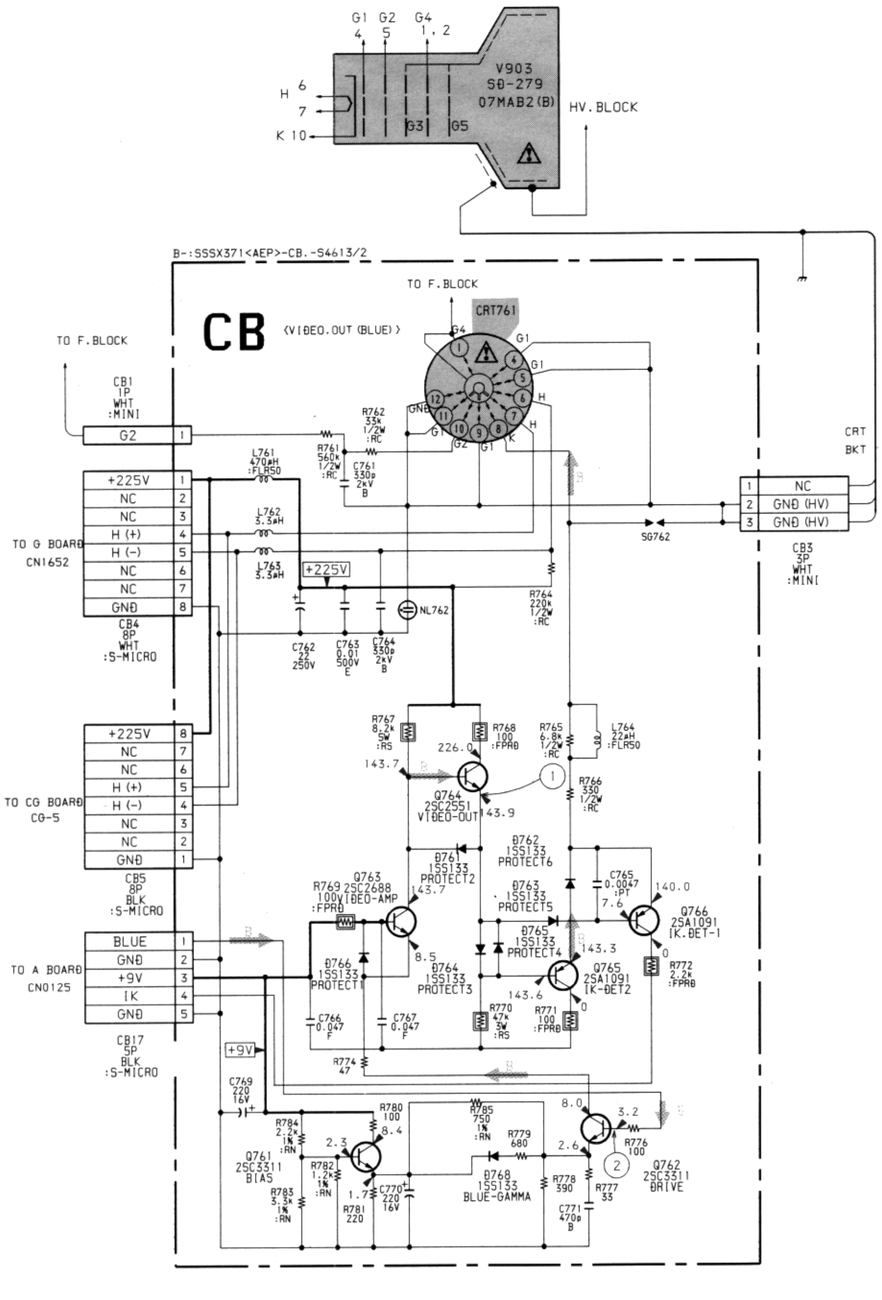








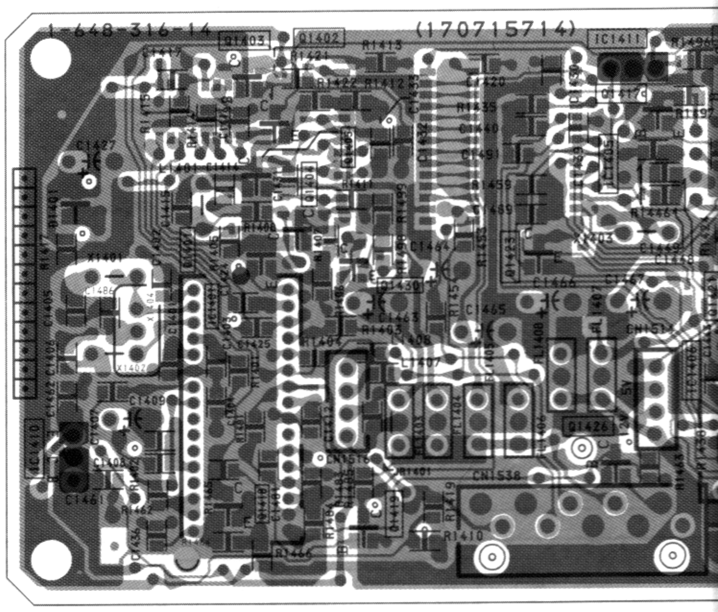


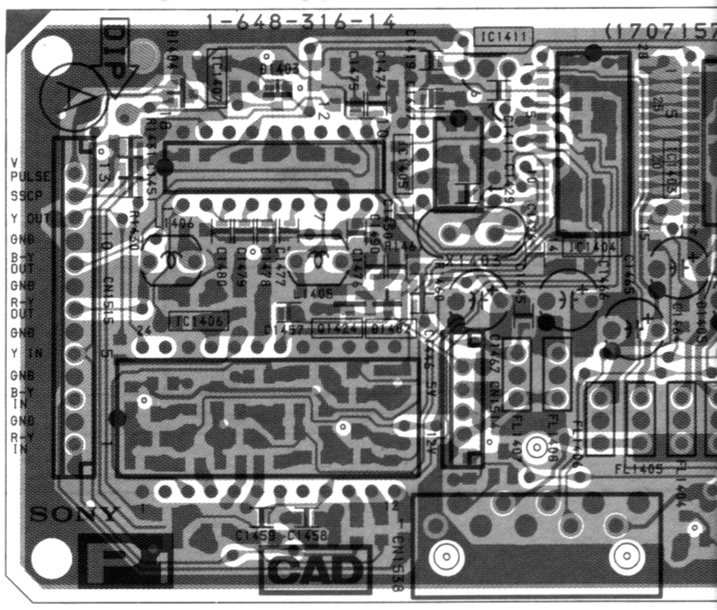


P1 [PICTURE IN PICTURE]

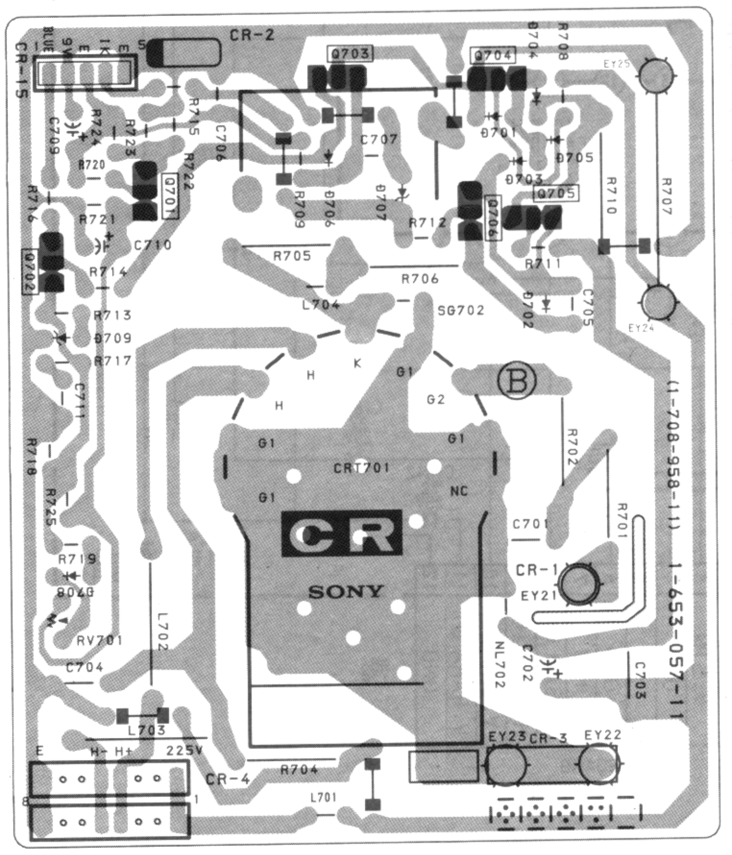
CR [VIDEO.OUT (RED)]

— P1 BOARD —



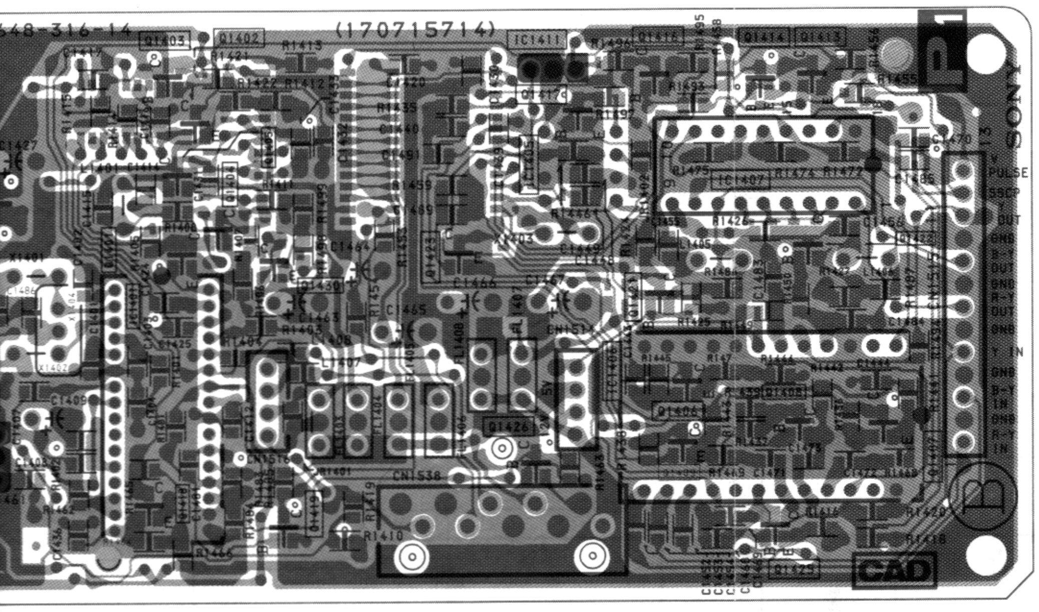


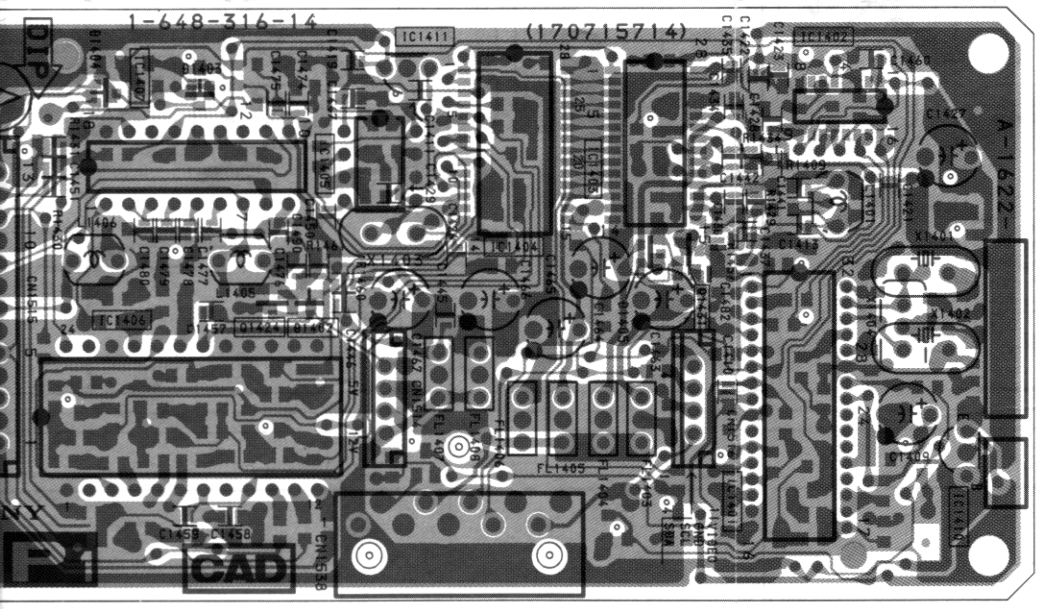
— CR BOARD —



[PICTURE IN PICTURE] **CR** [VIDEO.OUT (RED)] **CG** [VIDEO.OUT (GREEN)] **CB** [VIDEO.OUT (BLUE)]

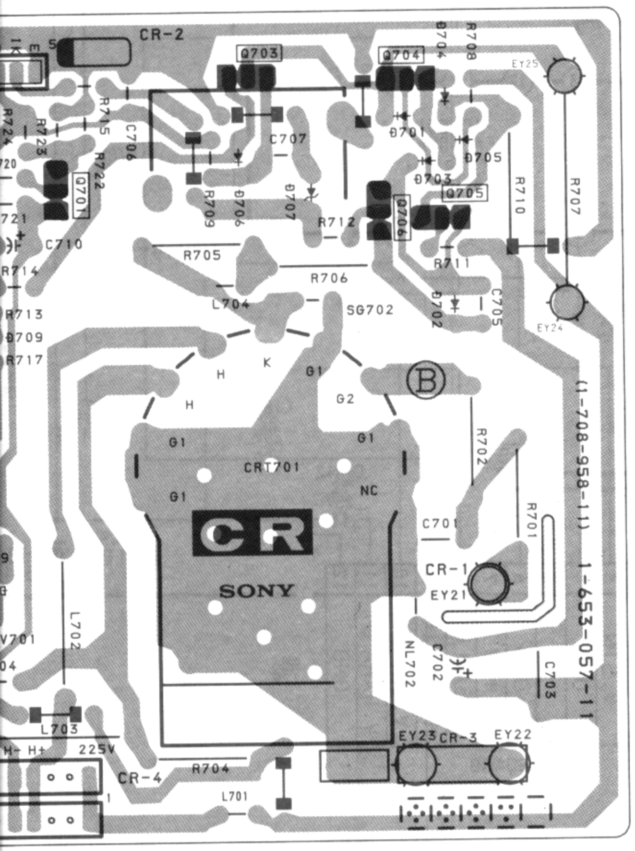
BOARD —



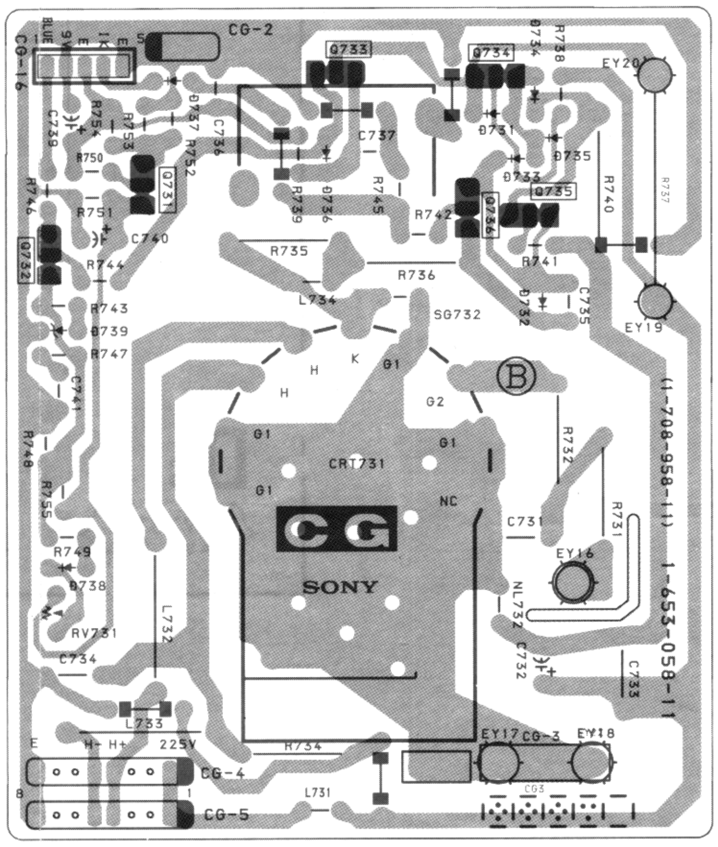


- ▒ : Pattern from the side which enables seeing.
- ▓ : Pattern of the rear side.

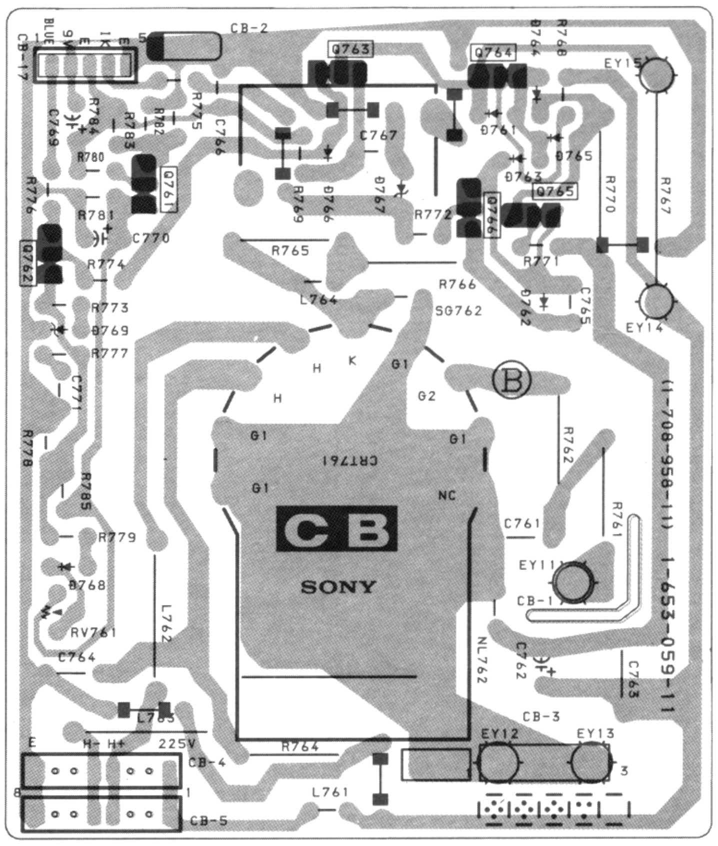
BOARD —

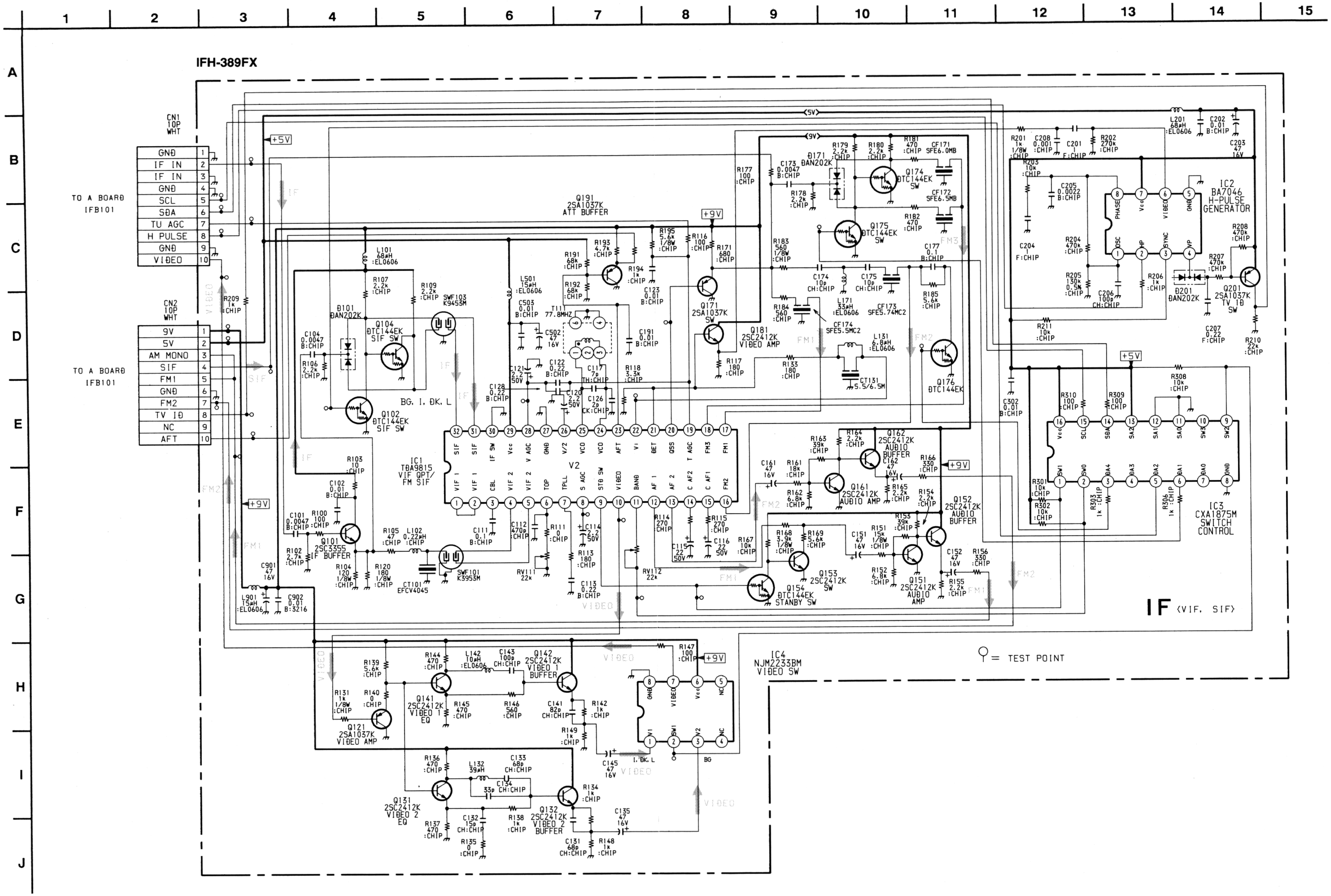


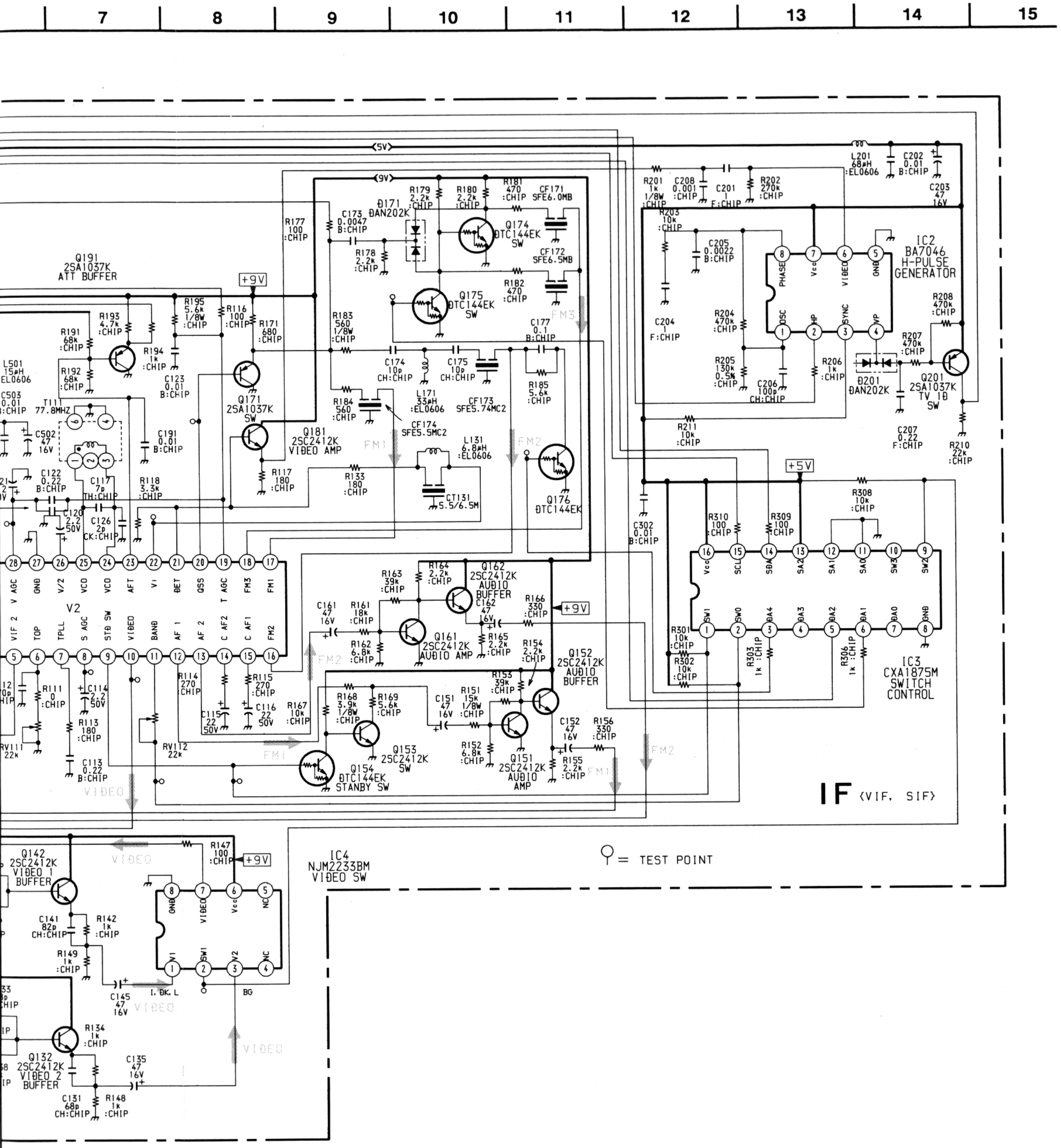
— CG BOARD —



— CB BOARD —

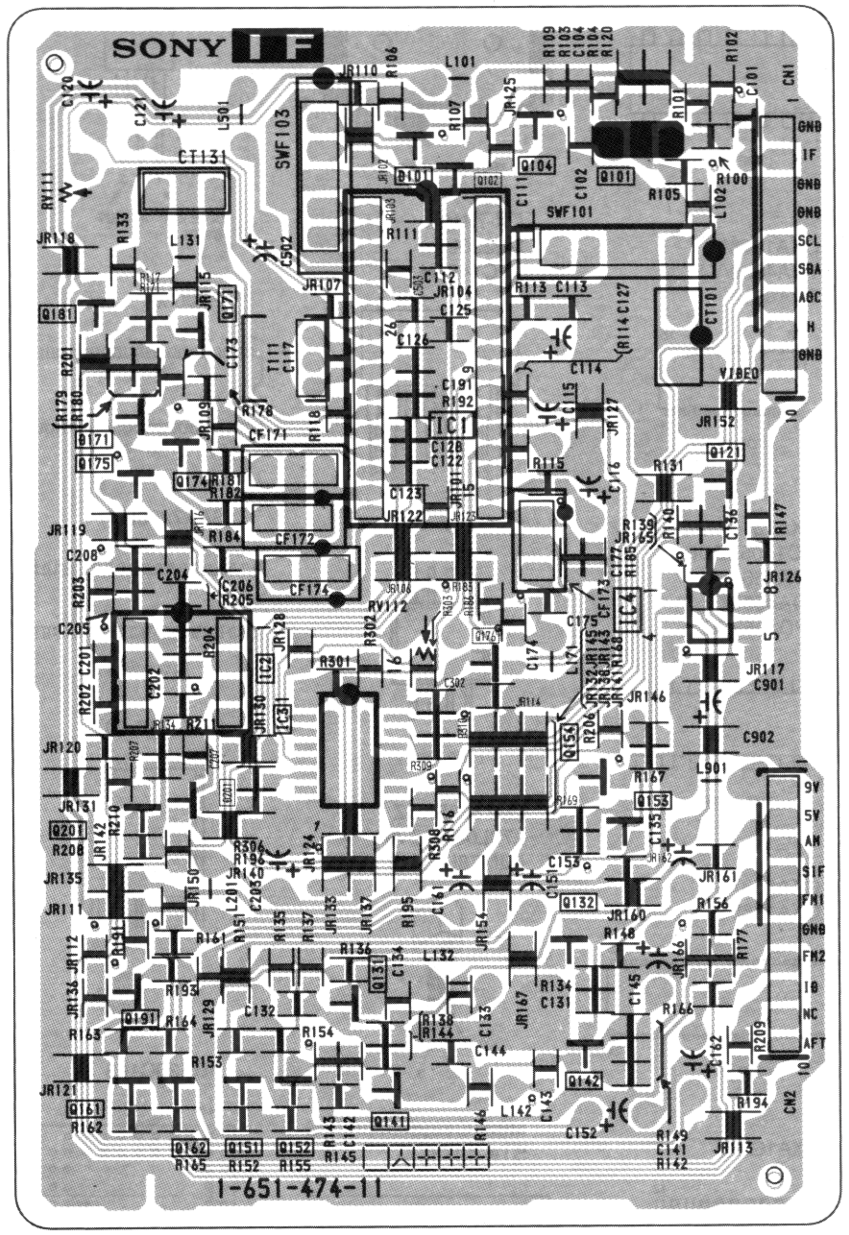



IFH-389FX
CN1 10P WHT
GND
IF IN
IF IN
GND
SCL
SDA
TU AGC
H PULSE
GND
VIDEO
TO A BOARD IFB101
CN2 10P WHT
9V
5V
AM MONO
SIF
FM1
GND
FM2
TV ID
NC
AFT
TO A BOARD IFB101
Q191 2SA1037K ATT BUFFER
Q101 2SC3355 IF BUFFER
Q102 DTC144EK SIF SW
Q104 DTC144EK SIF SW
D101 DAN202K
SWF103 K9453M
SWF101 K3953M
CT101 EFCV4045
T111 77.8MHz
IC1 TDA9815 VIF QPT/ FM SIF
BG, I, DK, L
Q171 2SA1037K SW
Q181 2SC2412K VIDEO AMP
D171 DAN202K
Q174 DTC144EK SW
Q175 DTC144EK SW
Q176 DTC144EK
CF171 SFE6.0MB
CF172 SFE6.5MB
CF173 SFE5.74MC2
CF174 SFE5.5MC2
CT131 5.5/6.5M
Q161 2SC2412K AUDIO AMP
Q162 2SC2412K AUDIO BUFFER
Q151 2SC2412K AUDIO AMP
Q152 2SC2412K AUDIO BUFFER
Q153 2SC2412K SW
Q154 DTC144EK STANBY SW
IC2 BA7046 H-PULSE GENERATOR
Q201 2SA1037K TV ID SW
D201 DAN202K
IC3 CXA1875M SWITCH CONTROL
IC4 NJM2233BM VIDEO SW
Q121 2SA1037K VIDEO AMP
Q141 2SC2412K VIDEO 1 EQ
Q142 2SC2412K VIDEO 1 BUFFER
Q131 2SC2412K VIDEO 2 EQ
Q132 2SC2412K VIDEO 2 BUFFER
I, DK, L
BG
+5V
+9V
5V
9V
IF (VIF, SIF)
= TEST POINT



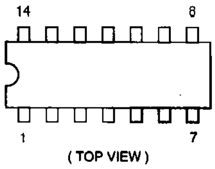
IF [VIF, SIF]

–IF BOARD–

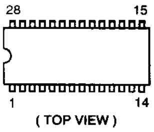


5-4. SEMICONDUCTORS

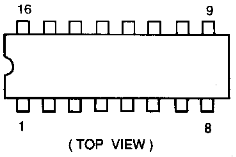
CA0007AD
LM324N
MB3614
µPC1394C



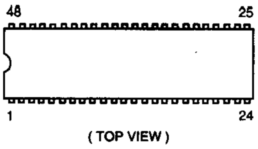
CXA1268P
TDA4650/V4
TDA6612



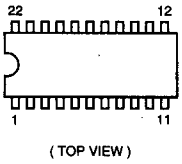
CXA1315P
MC14053BCP
TDA4661
TDA4665T
µPD4053BC



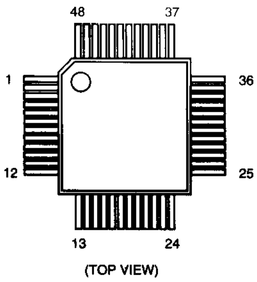
CXA1587S
CXA1855S



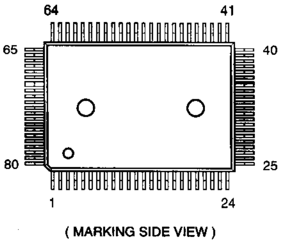
CXA1656S



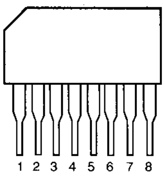
CXD2018Q



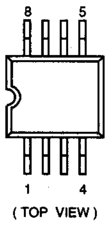
CXD2024Q



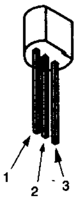
CX-7948A
M5220L
µPC1498H



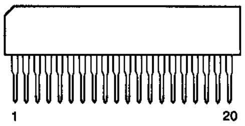
LM358D



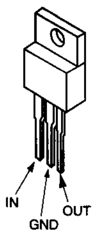
LM78L05ACZ
L78L08ACZ-AP
NJM78L05A



MB81C4256A-70PSZG
STK-4278L



MCT7809CT
MCT7812CT
NJM78M05FA
TA7812S
µPC2405HF



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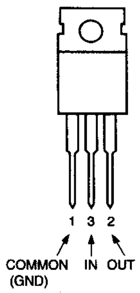
NJM7915FA



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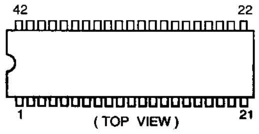

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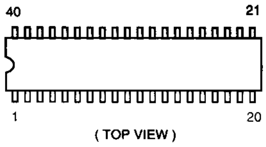

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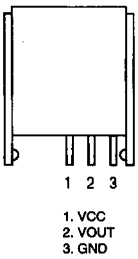

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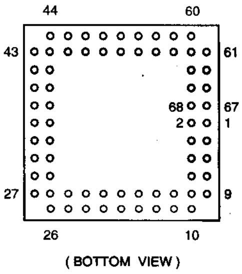

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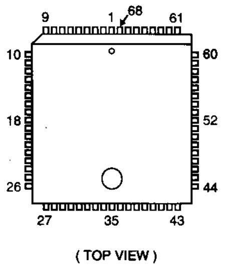

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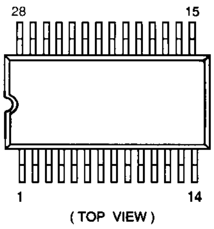

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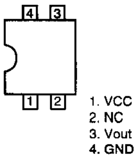

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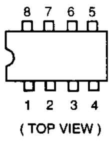

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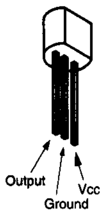

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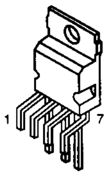

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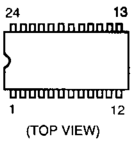

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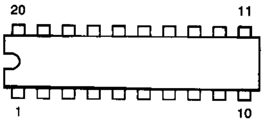

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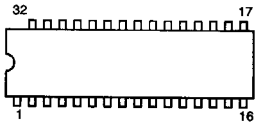

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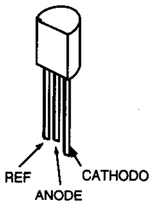

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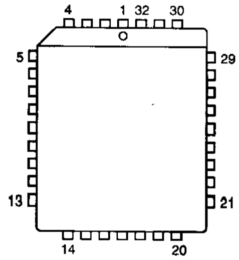

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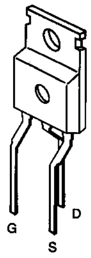

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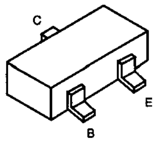

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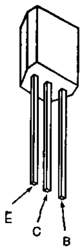

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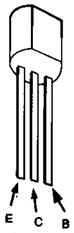

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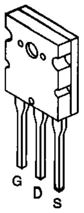

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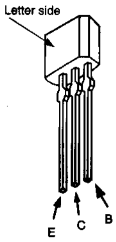

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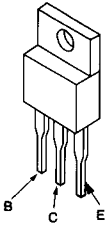

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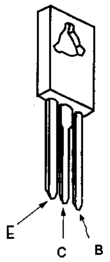

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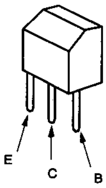

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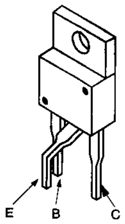

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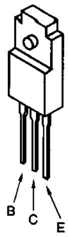

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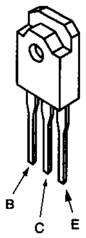

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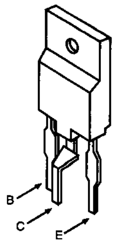

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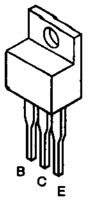

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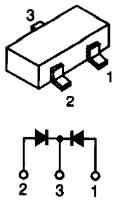

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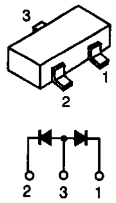

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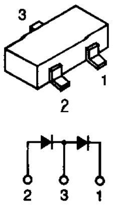

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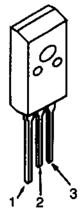

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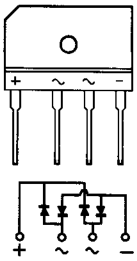

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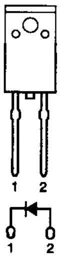

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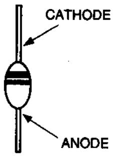

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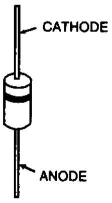

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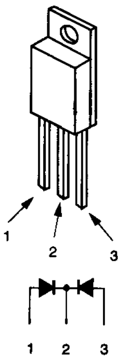

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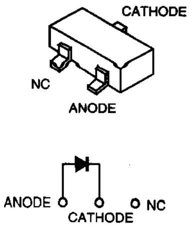

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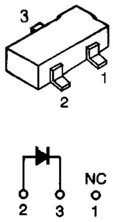

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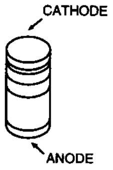

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MTZJ-7.5A
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MTZJ-13B
MTZJ-13C
MTZJ-22
MTZJ-33C
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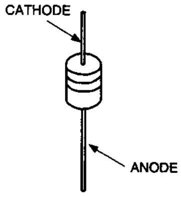

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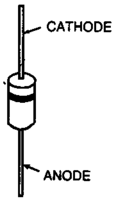

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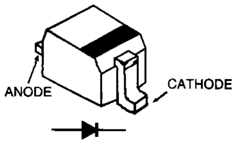

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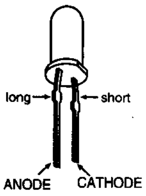
long
short
ANODE
CATHODE